

ROADS *and* ST *S*

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HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

McGraw-Hill Publishing Co., 1221 Avenue of the Americas
Chicago 10, Illinois

AUGUST 1955

**New Concrete Paving
Speed Record**

**3 MILLION TON
CRUSHING JOB**

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New Equipment, Page 16

Accepted as Controlled Circulation
Publication at Cedar Rapids, Iowa

**CARBIDE
INSERT?
OR
MULTI-USE?**

Twin Feather Mills Inc. chose TIMKEN® carbide insert bits for tough job on Idaho access road

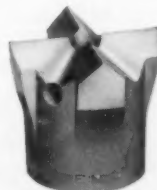
HERE'S a tough drilling job in anyone's book. The project: a thirty-mile access road to reach rich timber lands. The terrain is hilly and wooded and blast holes must be drilled into basalt, quartzite and granite. Twin Feather Mills Inc. chose Timken® carbide insert bits for the job.

Timken carbide insert bits are most economical for small-diameter blast holes, constant-gauge holes, and very deep holes. And they're your best bet for highest speed through hard and abrasive ground.

For drilling in ordinary ground, you get the biggest savings with Timken multi-use rock bits. With correct and controlled reconditioning, they give you lowest cost per foot of hole when full increments of steel are drilled.

Both types of Timken rock bits are interchangeable on the same steel. Dozens of different bits fit the same steel! Drillers can change bits on the job in just a minute. The need for large stocks of drill steels is eliminated.

All Timken rock bits are made of electric-furnace Timken fine alloy steel. A special shoulder union protects threads from drilling impact. For help in choosing the best bit for your particular job, call on the Timken Rock Bit Engineering Service. There's no obligation. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded
multi-use rock bit



Timken threaded
carbide insert rock bit

LOCATION: Lolo Creek-Musselshell Creek Access Road, Idaho County, Idaho.

OPERATING CONDITIONS: Very poor due to hilly, wooded terrain. Rock drilled is basalt, granite and quartzite.

**your best bet
for the best bit
... for every job**

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

ROCK RATED!

P&H

**Model
955-A
(2½ yd.)**



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Why now? Because the growing volumes for the new highway program will place heavier burdens than ever on your production equipment. You'll want the swing speed Magnetorque supplies for maximum output.

P&H MAGNETORQUE does it for you! Faster swings — with quicker starts and stops — give you cycles 20% faster than any other 2½-yard machine. Magnetorque will deliver it *now* — and years from now. With Magnetorque there's no friction, no wear. Lasts the life of the shovel.

If you're looking for the best investment, remember: The low-cost shovel is the one with the high cycle. You can bank on P&H Magnetorque! Write for literature. P&H Model 955 A — 2½ yd. P&H Model 1055 — 3½ yd.

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

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HARNISCHFEGER
CORPORATION • MILWAUKEE 46, WISCONSIN

the **P&H** *Line*



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POWER SHOVELS



PREFABRICATED HOMES



HOISTS



SOIL STABILIZERS



WELDING EQUIPMENT



OVERHEAD CRANES

... for more details circle 196, page 16



Flexibility like this pays off underground

This 28-ft-long Beth-Cu-Loy culvert pipe is flexing under its own weight to illustrate one of the special advantages of pipe fabricated from galvanized Beth-Cu-Loy sheet steel: its flexibility. And flexibility pays off several ways underground.

Flexibility allows the pipe to conform to irregular grades in the trench. It permits the absorption of changing loads caused by shifting soils or freezing action. And because a culvert made from Beth-Cu-Loy is flexible both transversely and longitudinally it can withstand

greater impact and vibrational stresses than rigid materials.

Drainage pipe made of Beth-Cu-Loy has other advantages, too. Weighing only a fraction as much per foot, it can be handled in longer lengths than comparable pipe of other materials. It requires fewer field joints, and no special lifting equipment.

Bethlehem does not fabricate drainage pipe, but does manufacture the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. This copper-bearing

steel carries a heavy coating of zinc and has excellent resistance to corrosion. It more than meets the specifications of the AASHTO.

If you would like to have further information about Beth-Cu-Loy, or the names of those who fabricate it into pipe, just get in touch with the nearest Bethlehem sales office.

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BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor; Bethlehem Steel Export Corporation

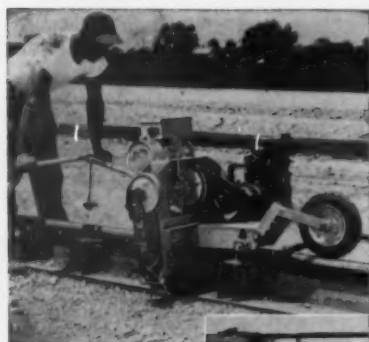
BETHLEHEM STEEL



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ROADS AND STREETS, August, 1955

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with "Form
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ROADS AND STREETS

Sixty-Three Years of Editorial Leadership

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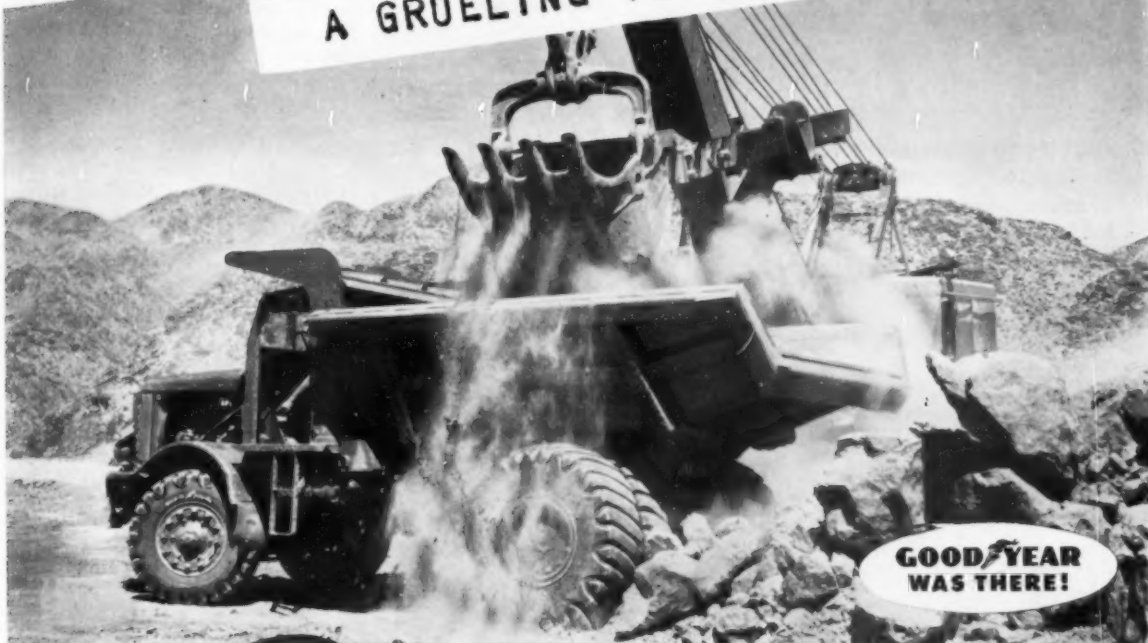
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ROADS AND STREETS, August, 1955

HEAVY LOADS, JAGGED ORE AT KAISER MINE---
A GRUELING TEST FOR TIRES!



Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

... for more details circle 194, page 16

ROADS AND STREETS, August, 1955

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CRAWLER OR MOBILE MODELS... GASOLINE OR DIESEL**



All Models Convertible to ALL Attachments!

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ROADS AND STREETS

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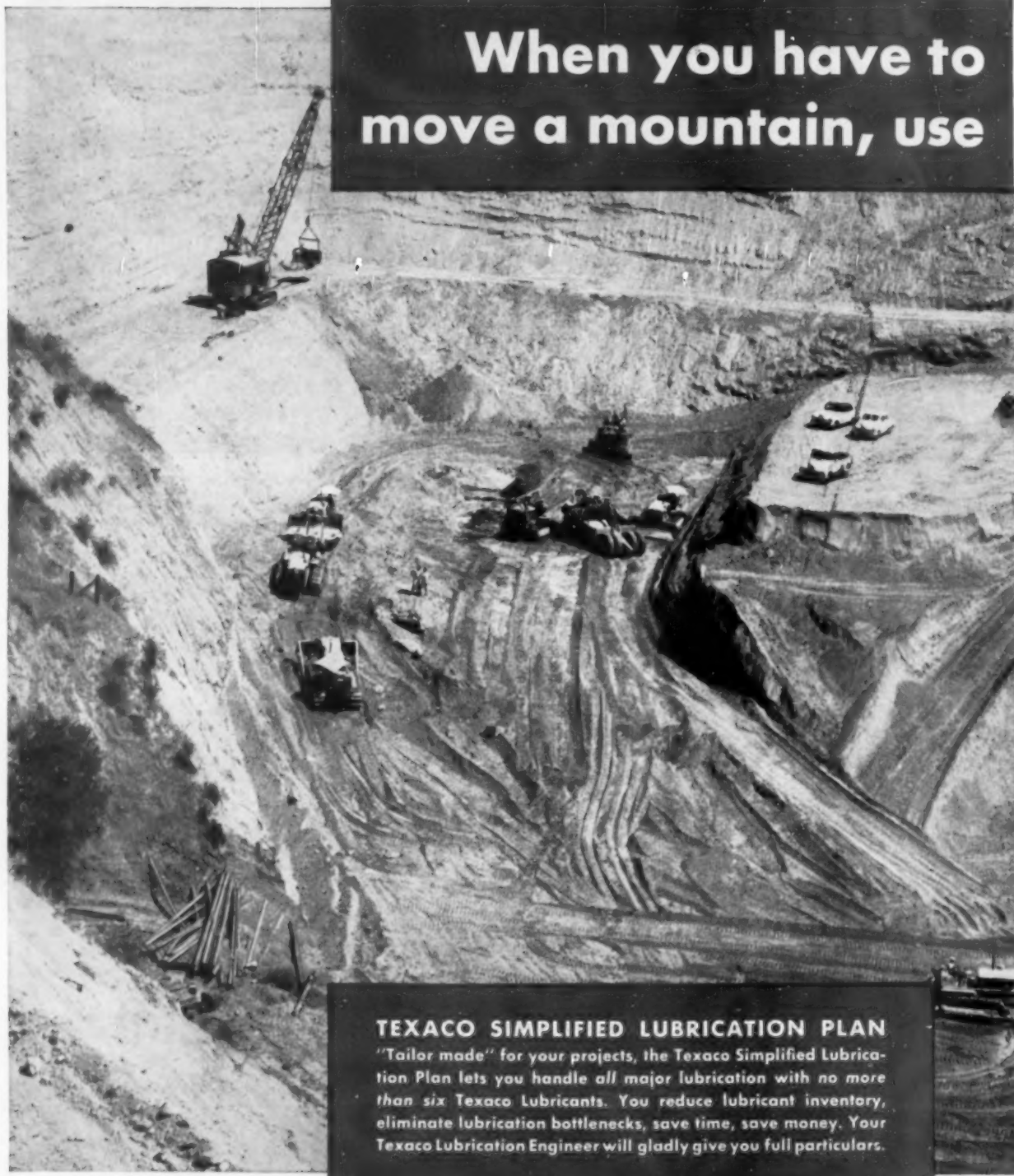
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For transmissions and differentials, use *Texaco Universal Gear Lubricant*. It assures smoother, quieter meshing, extends gear life and reduces maintenance costs.

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The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

... for more details circle 231, page 16

ROADS AND STREETS, August, 1955

ladder-type Trenchliners dig 16 inches to 6 FEET wide

Parsons ladder-type Trenchliners,[®] in 3 heavy-duty sizes, cover a wide range of trench widths and depths. For example . . . maximum cutting widths are 36, 42 and 72 inches, depending on model . . . with digging depths of 8½, 12½, and 17 feet. In addition to big work capacity, notice the many production boosting advantages you get when you put one of these Trenchliners on your job . . .

make vertical set-ins

Reverse traction lets Trenchliner hold the end of the digging boom flush with lateral ditch or against foundation wall . . . maintains a vertical face all the way down to bottom of trench.

undercut sidewalks

Sloping ladder-type boom reaches far under sidewalks from both sides . . . also undercuts curbs and gutters, cross pipes, and existing mains. Saves hand work.

hug curbs, buildings

When working next to curbs, fence rows or buildings, boom is shiftable across full width of carriage . . . digs behind either crawler. (Model illustrated cuts within 10 inches of side obstructions.)

dodge poles

Spoil conveyor shifts through Trenchliner by power in less than 1 minute to dump right or left . . . side-steps poles, trees without swerving from grade line.

load trucks

Arc-type spoil conveyor reaches up and out, loads into trucks. Discharge heights range from 6 ft.-4 in. up to 8 ft.-9 in., depending on model.

All these big production advantages are available to you in 3 sizes of ladder-type Trenchliners. Ask your Parsons distributor about the size best suited to your work. Also: 2 wheel-type Trenchliners, and small, rubber-tired Trenchmobile.[®]



PARSONS Trenchliners

PARSONS COMPANY, NEWTON, IOWA (Keshring Subsidiary)





221 Trenchliner cuts 16 to 36 inches wide, at depths to 8½ feet. Shiftable boom digs as efficiently behind either crawler as it does in center position. Power-shift conveyor gives controlled discharge . . . puts spoil back well back from edge of the trench.



250 Trenchliner digs 16 to 42 inches wide, at depths to 12½ feet . . . has ample truck-height discharge. On ladder-type Trenchliners, spoil conveyor is independent of digging boom, maintains constant discharge height regardless of position of boom.



Big 310 Trenchliner, shown here with dual booms, has 6-foot cutting width, and 12-foot depth. When used with single boom, it digs 18 to 34 in. wide, 17 ft. deep. Buckets and side-cutters on all Trenchliners equipped with Parsons easy-in, easy-out "Tap-In" teeth.

Bituminous mixer loads trucks, does stockpiling

Kwik-Mix bituminous mixers fit any production problem. Tower loader attachment gives discharge height up to 8¾ ft. Or, with skip extension track, mixer can be mounted on skids on elevated platform. Pug-mill mixing action, accurate heat control, and even bitumen distribution assure high quality mix. 2 sizes: 10 and 14 cu. ft. Also check Kwik-Mix concrete, plaster-mortar mixers, and Moto-Bugs® with hopper, platform, and fork lift.

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C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)



Koehring ½-yd. hoe digs 17¾-foot deep

With long reach, Koehring ½-yard 205 hoe puts dirt far beyond edge of cut, or gives 8¾-foot clearance height to load trucks. Close-coupled dipper pulls up tight to the goose-neck boom, avoids spillage. Powerful cable crowd, fast line and swing speeds maintain big-yardage output. This heavy-duty 205 converts to ½-yard shovel, ½ to ¾-yard dragline or clamshell, 10-ton crane. On truck mounting the 205 has 15-ton lift capacity.

KOEHRING Company
Milwaukee 16, Wis.

T 61



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ROADS AND STREETS, August, 1955

New Increased Power International

- NEW** Power... New gearing... New ruggedness—for greater production
- NEW** Track Frames... 300 per cent stronger
- NEW** Finger-Tip Power Steering... advanced hydraulic design
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- NEW** Appearance... sleek grille, heavy fenders, 75-gallon fuel tank. Better visibility... control-tower view front and rear

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TD-18A Now with 103 Drawbar H.P.

Here's the crawler tractor with everything contractors need to meet increased competition—increased workpower, increased ease of operation, increased durability:

The improved INTERNATIONAL TD-18A, now with 103-drawbar horsepower at 24,300 lbs. maximum drawbar pull in first gear at rated rpm.

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INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



INTERNATIONAL
INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD

... for more details circle 202, page 16

ROADS AND STREETS, August, 1955



Now built by LIMA...the portable, 3/4 - swing, extra-output BADGER

LIMA is proud to be able to offer the fast-moving, fast-working BADGER as part of the standard LIMA line of quality-built machines. This highly portable, hard-working, ruggedly built 1/2 yard shovel is easily convertible for use as a trench hoe, clamshell, dragline, pile-driver, crane or skimmer. Available with gasoline, Diesel or electric power, the BADGER has proved on the toughest jobs that it's the fastest, most dependable shovel in its class.

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|-----------------------------|----------------------------|
| 1. Lighter swinging weight. | 5. Extra dumping height. |
| 2. Greater stability. | 6. Extra reach. |
| 3. Better visibility. | 7. Anti-friction bearings. |
| 4. No tail swing. | 8. Easily portable. |
| | 9. Easily convertible. |

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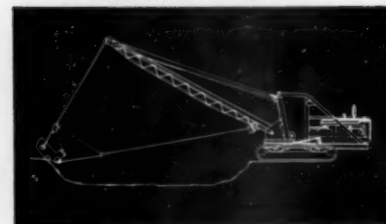


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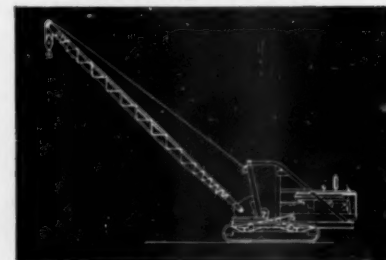
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BADGER Shovel Conversion



BADGER Dragline Conversion

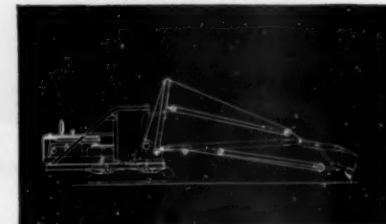


Above

BADGER Crane Conversion

Below

BADGER Trench Hoe Conversion



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WITH YOUR
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AND A
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With this combination, ONE MAN can keep a fleet of trucks working all day long, or cast more dirt than any other group of machines — and with less manpower requirements and cost of operation.

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For more-than-ever profitable use from your GALION Grader, add the multi-purpose B & L Elevating Grader Attachment. Write for literature.



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V-type with eleven teeth mounted in a heavy box-type block of welded construction. Teeth are made of tough steel and have renewable heat-treated points. A valuable attachment for tearing up old pavements or reworking old gravel road surfaces to remove chuck holes, ruts, etc.

Other Galion attachments include Creeper Transmission • Hydraulic Shiftable Moldboard • Snow Plow and Wing • Bulldozer • Right or Left 2-ft. Moldboard Extension • Enclosed Cab • Write for literature.



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THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio

... for more details circle 190, page 16

ROADS AND STREETS, August, 1955

WHAT'S NEW in Equipment and Materials

Automatic Drive for Lift Trucks

A new and simplified torque converter-type drive, Hystamatic Drive, is now offered for the 3000 lb. capacity UC-30 and the 4000 lb. capacity YC-40 lift trucks of Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore. The Hyster Hystamatic Drive design includes a clutch for precise speed regulation when combining the traveling and hoisting operation. Partial engaging of the clutch allows a reduction in traveling speed while retaining fast lifting speed. This factor enables operators to raise loads at Maximum rate while maneuvering into load position. There is no delay between pressure on the clutch control and actuation of the clutch.

The drive assembly combines lift truck transmission and drive axle into one unit. Final internal gear reduction is 3.1 at wheels. All gears and bearings operate in oil from common supply continually maintained at proper working temperatures by rotation of the converter, which draws air through the drive and housing.

For more information circle 101 on Service Coupon this page and mail now.

Elevating Grader Attachment for Motor Graders

The new 42 in. troughing belt Elegrader, announced by Reiser Corporation, Blair, Nebr., incorporates an outrigger design for 27 ft. length conveyors. This new unit has been adapted for Adams and Caterpillar motor graders.

The tandem caster outrigger is attached to the motor grader with 3 bolts located in a plane parallel to the motor grader so that both motor grader and outrigger will adjust to any variations of ground level. The tandem wheel assembly has a 24 in. oscillation without interference. Exceptional well balance and working characteristics in high production casting or loading — 800 cu. yd. per hour with 11 ft. clearance under the head pulley pipe guards are claimed by the manufacturers. Better weight distribution of the motor grader and upper carrier counteract the off-side pull of the outrigger. The outrigger becomes a part of the conveyor for fast job to job moving. A quick connecting drawbar is attached to the lower conveyor. The tandem caster wheels are turned 90 degrees and pinned. The boom is lowered and cables and chains disconnected. The carrier then is rolled out on its own wheels from under the motor grader and ready for attaching to a motor grader drawbar or any prime mover.

For more information circle 102 on Service Coupon this page and mail now.

Core Drilling Machines

Two new diamond core drilling machines, Model 30 and Model L-2 announced by Sprague and Henwood, Inc., Box 446, Trenton 2, N.J., have been developed to provide compact units which can be moved easily from one location to another and can also be relied upon to produce good cores rapidly, up to moderate depths.

Both models can be powered by either a diesel or a gasoline motor, an air motor or an electric motor, as preferred by the purchaser. Normally skid-mounted they are available, also, with an improved type of trailer mounting, for easy portability without tying up a truck. A third option provides a complete self-contained core-drilling rig mounted on a four-wheel drive truck.

Simplified designs, alloy-steel gears, anti-friction bearings and other modern features are claimed to assure low-cost trouble-free operation.

For more information circle 103 on Service Coupon this page and mail now.

More equipment news begins on page 126

Machine Determines Soil Shear Strength Quickly

Shear strength of soil can be determined quickly and easily with the K-W unconfined compression testing machine marketed by the Tinius Olsen Testing Machine Co., Willow Grove, Pa. Axial load — applied to soil without lateral support — is read directly on the load ring attached to the upper sample head.

For normal application, this new compression testing machine, designed by Karol and Warner, is furnished with a 250-lb. capacity load ring. However, load ranges of 100, 250 and 500 lb. are available, while the sturdy frame is built to withstand a maximum load of 2,000 lb.

Weighing under 50 lb. and occupying less than 1½ sq. ft. of space, the entire unit is easy to transport and can be set up at will.

For additional information, write to the Tinius Olsen Testing Machine Company, 475 Easton Road, Willow Grove, Pa.

For more information circle 104 on Service Coupon this page and mail now.

High Pressure Hose

A new, high pressure hose, designed specifically for the hydraulic equipment industry is being placed on the market by Goodyear Tire & Rubber Company's Industrial Products division, Akron 16, O. Called Flexsteel hydraulic control hose, the new product is wire-reinforced and is available in sizes from ½ in. to 2 in. inside diameter. Depending on size, the hose handles pressures ranging up to 5,500 lb. per square inch.

Thoroughly field tested, Flexsteel hydraulic control hose is constructed to meet military, Society of Automotive Engineers and Rubber Manufacturers Association specifications.

For more information circle 105 on Service Coupon this page and mail now.

For more items . . . see page 126

MAIL THIS COUPON TODAY!

ROADS & STREETS
22 West Maple Street
Chicago 10, Illinois

**CIRCLE THE
NUMBERS
AND MAIL NOW!**

Please send me further information on products and materials mentioned in the August Roads & Streets as circled below

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NOT GOOD AFTER SEPTEMBER 15, 1955

A READER SERVICE FOR YOUR NEEDS



TRENCHING 7 MILES of Indianola Avenue, a heavily traveled thoroughfare in Columbus, Ohio, called for a fast-moving job. The first step in opening the ditch was to

line-cut and break a 7" course of paving brick topped with asphalt. Two 80 lb. breakers, powered by a Jaeger "125" Roto Air-Plus, were used for this work.

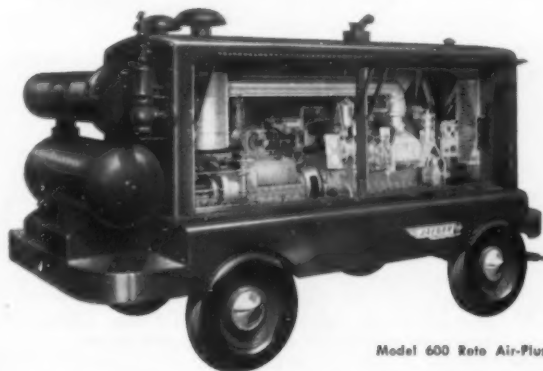
How Jaeger "125" Rotary speeds street work

On the above job, the instant-acting control of the Jaeger rotary, enabling it to maintain 100 lbs. minimum pressure under all air demands up to 125 cfm, made it possible to run two 80 lb. breakers at full efficiency, cutting and breaking an average of 400 linear ft. of 3 ft. wide trench (1200 sq. ft.) each 8 hours.

Because the higher efficiency of the Jaeger Roto enables it to operate at more economical engine speeds, fuel consumption on this job averaged only 1½ gallons an hour.

For big work, equally high efficiency is offered in the Jaeger Model 600 rotary. Jaeger reciprocating type compressors also continue to be available in all Jaeger "new standard" ratings with the exception of the 600 cfm size. For full information and comparative prices, see your Jaeger distributor — or send for Catalogs JC and JCR5.

For big work, Jaeger offers the Roto "600", illustrated below. It is the first fully efficient 600 cfm rotary compressor.



Model 600 Roto Air-Plus

THE JAEGER MACHINE COMPANY

223 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • LOADERS • PAVING MACHINES

... for more details circle 207, page 16

ROADS AND STREETS, August, 1955

COSTS LESS

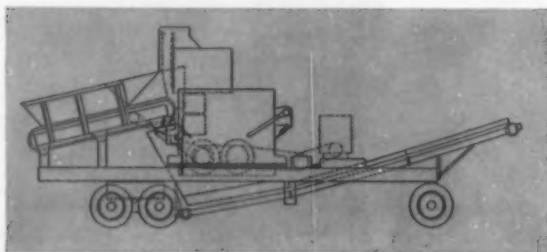
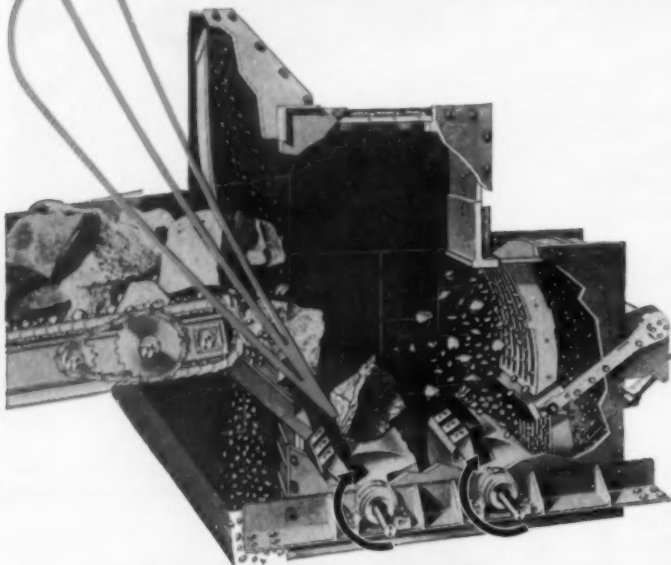
High ratio of reduction. One machine does combined primary and secondary reduction job . . . lower initial cost.

BREAKS CLEANER, FASTER

Two hammer rotors turn in the same direction . . . eliminate congesting of breaker, promote faster feeding, faster discharge, increased capacity.

UNIVERSAL IMPACT MASTER

Featuring Universal's exclusive operating principle: Controlled Impact Action.



Portable Impact Master with apron feeder, folding discharge conveyor, three-speed transmission, and power.

It's no wonder Universal's Impact Master is the most efficient breaker you can buy. It can eliminate secondary crushers, take shovel-loaded run-of-quarry rock and reduce it to finished size in three seconds.

Here is why the Impact Master breaks rock faster and more economically. Both rotors turn in the same direction, assuring straight line flow of broken material away from hammers. Radial feed and absence of congestion provide unrestricted penetration of rock into the hammer circle for perfect impact. Hammers are always clean, always ready to break incoming rock most efficiently.

This saves you money because fewer hammer blows are required to do the job . . . less wear throughout machine . . . less horsepower.

Result: increased capacity of clean, cubical aggregate. What's more, finished product size is controlled easily with simple mechanical adjustments.

Universal's Impact Master provides capacities up to 1000 tons per hour. Get complete profit-making facts now. Write for literature.

Available in portable or stationary set-ups.



The method of impact breaking which permits control of feeding, breaking and product size.

UNIVERSAL ENGINEERING CORPORATION

631 C Avenue N.W., Cedar Rapids, Iowa

A Subsidiary of Pettibone Mulliken Corporation,
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... for more details circle 239, page 16

ROADS AND STREETS, August, 1955

ROADS AND STREETS

Sixty-Three Years of Editorial Leadership

Washington News Letter



By Duane L. Cronk

August 8, 1955

A shocked and dismayed highway industry last week heard the House wipe out two bills that would have launched the most ambitious highway construction program ever visualized for this country.

- The Eisenhower "grand plan", a bond-financing program that would have helped to raise \$39 billion in the next 10 years, was killed, after intense debate, by a narrow margin of six votes. The Senate had previously cast it aside by a two-to-one vote. Voting, along strictly party lines, indicated that the Democrats had chosen to squelch the measure.
- The Democratic bill, which would have provided \$48 billion, partly through sharply increasing taxes on gasoline, diesel fuel and tires, was violently attacked. Members of both parties kicked it aside, 292 to 127.

* * * *

Almost everyone had hoped for "some sort" of highway legislation. Both of the bills offered to the Congressmen recognized the scope of the highway problem. Both sparked large, long-range roadbuilding programs. It appeared that the average Congressman had only to choose the one consistent with his personal philosophy - the pay-as-you-go Fallon Bill or the Eisenhower bond-financing bill.

But both were killed - in spite of a tide of public opinion, in spite of the soundness of the plans, and in spite of party leadership which, on both sides of the aisle, had demanded that the House produce a big road bill this year.

* * * *

Partisan sentiment defeated the President's program, without doubt. The Democrats, unwilling to see the Administration credited with a "grand plan," voted against it almost to the man. The Democratic leaders, in turn, were surprised - only minutes later - to find their bill, which proposed highway user tax increases, caught in the huge wheels of a trucker's lobbying juggernaut. Up in arms over taxes on tires, inner tubes, gasoline and diesel fuel, the trucking interests scored a total victory in defeat of the measure.

"The biggest lobbying campaign I have seen in 17 years as a Congressman," Congressman Harry J. McGregor of Ohio called it. Legislator after legislator told of receiving thousands of telegrams, letters and personal calls from truckers and their suppliers.

(continued on next page)

Only the impending close of the session frustrated action on compromise proposals. Many Congressmen, on both sides, declared that if a compromise had been in readiness they would have voted for it.

The encouraging point is that they mean a compromise in financing, not in the huge sums needed for roadbuilding. There was widespread recognition of the problem. Already, some Congressmen are preparing measures that may be accepted at the next opportunity. As Congressman Scudder (California) said:

"Certainly, you could not expect compromise measures to be attractive until each side had lost hope in his own plan. Now that both have been cancelled out, a compromise measure may meet general acceptance at the next session."

* * * *

"We can wait another few months and afford a few dry runs for something as big as this," one Washington observer pointed out. "The road program proposed is 60 times as large as the Panama Canal job and it hasn't seen a fraction of the controversy that hampered that single project. And look at Dixon-Yates! We're still ahead of the game."

Another old-timer put it, "The idea of such a gigantic roadbuilding program is only a year old - 12 months - that's all. And this was its first legislative test. What do you want . . . miracles?"

The general consensus is that public appreciation of the need for roads will increase, not diminish, over the next few months and that the case for a program of such dimensions will be stronger than ever when Congress meets again.

* * * *

In the meantime, there is an encouraging story, little publicized, in what state legislators have accomplished this session to accelerate their own roadbuilding programs. Taxes, bond issues and general appropriations have been boosted substantially in a number of states. Toll road projects, stymied in the uncertainty of what Uncle Sam would do, will be released from idleness. Here, briefly, is good news of activity in many places:

- Fourteen states this year pushed their gas taxes upward as much as 2¢ per gal. to raise an estimated \$187 million more for highway improvement.
- Twelve states authorized or took long steps toward authorization of general highway bond programs, some of them very substantial.
- Ten states authorized specific toll construction projects or created toll authorities. A number of large jobs are involved.
- Two more states moved on their way toward constitutional amendments which would protect user tax revenues from diversion to non-highway uses.
- An 8 percent growth in traffic volume and swelling registrations means even greater highway revenues from existing tax and license fee rates.

Good roads advocates are pleased with these signs of progress on the state level, temporarily overshadowed as eyes were focussed on Washington.



**BIG,
STRONG
PIPE**

needs American Welded Wire Fabric

Concrete pipe needs to be reinforced with Welded Wire Fabric for extra strength, and long life. American Welded Wire Fabric can now be obtained in circumferential wire sizes up to and including $\frac{1}{2}$ " wires at 2", 3", 4", and 6" on centers.

American Welded Wire Fabric is more widely used to reinforce concrete pipe than any other reinforcing material. Its high yield strength wires are accurately welded at every intersection. This provides special anchorage for the reinforcement in the concrete. It is quality controlled from the time

the steel is made until the complete fabric is rolled up and packaged for delivery. Meticulous quality control assures you a reinforcement that meets your toughest requirements. That's why it is wise to use American Welded Wire Fabric for pipe, and for any other reinforced concrete.

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EVERY TYPE OF REINFORCED CONCRETE CONSTRUCTION NEEDS

USS AMERICAN WELDED WIRE FABRIC

UNITED STATES STEEL

... for more details circle 165, page 16
ROADS AND STREETS, August, 1955



AN OUTSTANDING NEW TEAM for Ditching, Digging

INTRODUCING

the Allis-Chalmers
WD-45 Wheel Tractor
with Henry Backhoe



Whether it's digging ditches, trenches, culverts, footings or foundations, you'll find this team's power, mobility and versatility ideal for use on any dirt-moving job. Check the features that make this machine a big performer at low cost:

PLENTY OF POWER — for big-scale production. The WD-45 engine with POWER-CRATER design develops over 45 belt horsepower . . . to give you more power per dollar . . . more work capacity than other tractors of this type. Thousands already in use have given the WD-45 nationwide fame as a performance leader.

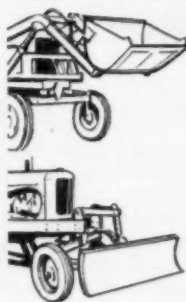
PLENTY OF WEIGHT — 5,325 lbs distributed right, give you the added traction and stability you need for tough, heavy digging and backfilling. It's a combination of a big, rugged wheel tractor and heavy-duty hoe to give years of continuous service.

MANY OPERATING FEATURES — let the operator do an efficient, thorough job in less time. With two-clutch control, the operator saves time because he can keep

tractor in low gear while digging — can start and stop it on short moves with easy-to-reach hand clutch. The bucket, working like a giant hand, reaches out 12 ft, 8 in . . . digs 8 ft down . . . swings 160 degrees for wide area dumping. Backhoe assembly is all-steel, box-channel construction to take rough, hard use.

MANY SERVICE ADVANTAGES — will save you money. Engine features like exhaust valve rotators, removable cylinder liners, pressure lubrication give long life and lasting performance. Backhoe features, like replaceable bushings on all wear points, provide easy maintenance.

PLENTY OF VERSATILITY — keeps the WD-45 with backhoe busy all the time. The unit is mobile enough to reach any job, especially the hard-to-get-to places. With power-shift rear wheels, the tread can be adjusted in less than five minutes when extra stability is needed. Choose from six interchangeable buckets, 16 to 24-inch widths. Front-end loader and backfill blade attachments are available as optional equipment.



See the world-famous WD-45 with Henry Backhoe at your Allis-Chalmers industrial dealer, or write direct to the company for literature.

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.



NOW! Lowest Prices!

Highest Powered
Dodge Trucks
Ever Built!



LOWEST PRICES! Many standard models of Dodge trucks are priced lower than all other makes! Yet with these low prices, quality-built Dodge trucks are dependable as ever.

HIGHEST POWER! Power-Dome V-8 engines, with 169 to 202 hp., are the most powerful of any leading trucks. Save time, save on operating costs, with these short-stroke V-8's! You'll save with Dodge thrifty 6's, too!

THE FORWARD LOOK! Now Dodge brings the Forward Look to trucks. New wrap-around windshield (biggest of any make!) means added visibility and safety! More reason why you should look at Dodge before you buy any truck. Why not phone your dependable Dodge truck dealer, today?

DODGE "Job-Rated" TRUCKS ➤ WITH THE FORWARD LOOK!

... for more details circle 173, page 16

ROADS AND STREETS, August, 1955

DIESEL AND GASOLINE ENGINE OPERATORS

A NEW PM TOOL



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VEHICLE NO. _____ MAKE _____
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ADC* Oilprint Analysis

CHECKS CRANKCASE OIL IN MINUTES

Shell Research gives you new
oil-change yardstick—

Now—operators can test crankcase oil in the short time allotted for refueling and crankcase oil checks. The Shell ADC Oilprint Analysis gives a practical and accurate oil evaluation in minutes.

ADC Oilprint Analysis means big savings when used in your preventive maintenance program . . . gives valuable information on engine and oil

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See for yourself how the new Shell ADC Oilprint Analysis can save you money in preventive maintenance. Let us show how you can use this new service for your equipment.

SAVES... Time, Money, Engines, Oil

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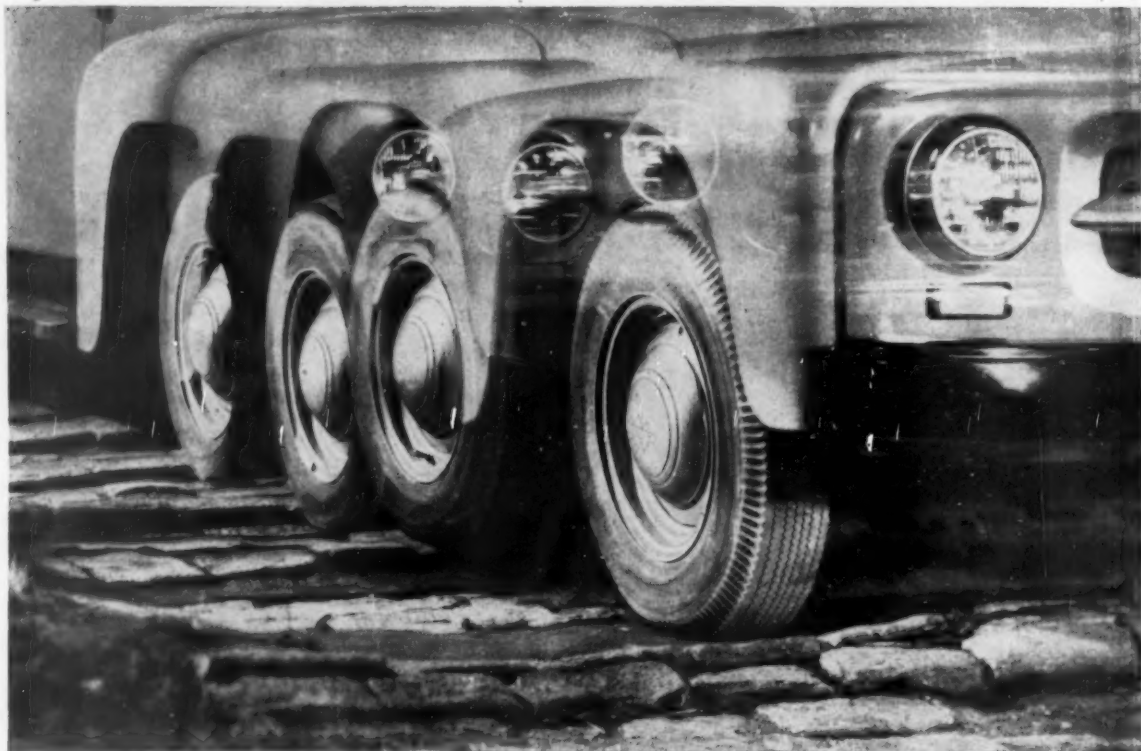
50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA



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ROADS AND STREETS, August, 1955

1,400 crash landings a minute...



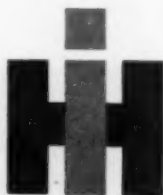
Here's a beating your truck will never have to take. This INTERNATIONAL Truck is pounding over the Belgian Block course . . . a torture track so bumpy that, at only 12 miles per hour, it slams wheels up and down 1,400 times a minute—so rugged that drivers are replaced every 20 miles of the 400-mile test.



You save the **BIG** money in construction hauling with all-truck built INTERNATIONALS. 200 basic models from 4,200 to 90,000 lbs. GVW—conventional and COE, 4-wheel, 6-wheel, four-wheel-drive. Axle and transmission ratios for every need.

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We torture INTERNATIONAL Trucks this way to be sure that sheet metal, cabs, springs and all running parts will stand up longer. So that our trucks will have utmost roadability, minimum wheel fight, maximum comfort. It's all a part of INTERNATIONAL engineering and design to save you the BIG money—the operating and upkeep money.

INTERNATIONAL engineers are never called upon to adapt passenger car engines or components. They design INTERNATIONALS with extra margins of strength—build them to save you the BIG money in the long run.

Yet with all this all-truck extra value, INTERNATIONALS are competitively priced. Let your INTERNATIONAL Dealer or Branch show you the right INTERNATIONAL for you—all-truck built to save you the BIG money!

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL® TRUCKS

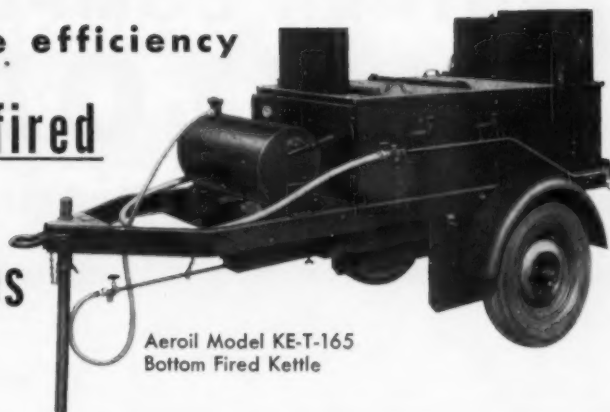
... for more details circle 203, page 16

ROADS AND STREETS, August, 1955

more economy...more efficiency

Aeroil's bottom fired asphalt, tar, pitch melting kettles

FOR CONSTRUCTION
AND MAINTENANCE



Aeroil Model KE-T-165
Bottom Fired Kettle

more economy!

Twin economy is yours with every Aeroil melting kettle! Save on initial cost thanks to Aeroil's mass production manufacturing methods. Save on operating costs with proven "wrap-around heat flow" design that instantly spreads 2000°F. direct heat for fast action, no wasted time. Plus many more engineered-in economy features!

more efficiency!

Be sure of more melting kettle efficiency by selecting the exact kettle to fit your specific needs. Whatever the job, an Aeroil standard model or one custom-built to bid specifications will insure more efficiency with year after year of trouble-free service!

more product features!

Since 1917, Aeroil has designed and developed the kind of melting kettles construction companies and maintenance departments want and need! Here's a tally of some of the features that are yours today: choice of firing (LPG or Oil) . . . choice of mounting (pneumatic tires, skids, hard rubber or steel wheels) . . . full selection of types and sizes . . . and many, many more advanced-engineered features that are backed by an unconditional one year guarantee!

Attention Officials, Engineers, Contractors: Send coupon for useful product literature.

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"Quality Guaranteed Products Since 1917"

Melting Kettles • Melting Furnaces and Compound Pots • Tool Trailers •
Torches and Burners • Concrete, Tool, Space, Water Heaters • Coating,
Cleaning, Finishing Hot Dip Tanks • Roofers and Pavers Accessories

... for more details circle 247, page 16

ROADS AND STREETS, August, 1955

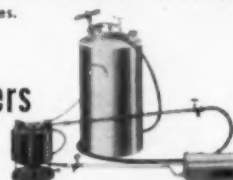
MORE TIME AND MONEY-SAVING AEROIL EQUIPMENT



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CUT-BACK SPRAYERS that permit one-man penetrating, patch or shoulder work. POWER DRIVEN SPRAYERS AND EMULSION SPRAYERS for rapid, economical application of materials direct from shipping drum. Recommended for all light liquids normally used in construction and maintenance having a maximum viscosity of 115 furl at 77°F. POWER AND HAND SPRAY ATTACHMENTS to fit any make melting kettle. PORTABLE SPRAYERS for disinfecting, weed killing and other similar chores.

torches and burners



HEAVY-DUTY TORCH OR BURNER OUTFITS for economical, instant heating of oil-fired kettles. PORTABLE TORCHES for thawing, heating equipment and tools as well as scores of general uses in the field. COMBINATION PORTABLE TORCH-SPRAY OUTFITS.

plus "HEAT-MASTER" KETTLES with exclusive patented heat riser • "TOOL-MASTER" TOOL TRAILERS • TOOL-HEATING EQUIPMENT • PAVERS ACCESSORIES

FILL OUT AND MAIL NOW!

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Dept. RS, 69 Wesley St., South Hackensack, N. J.
Please send me your literature on:

☐ melting kettles ☐ sprayers
☐ torches and burners ☐ other: (.....)

Name.....Title.....

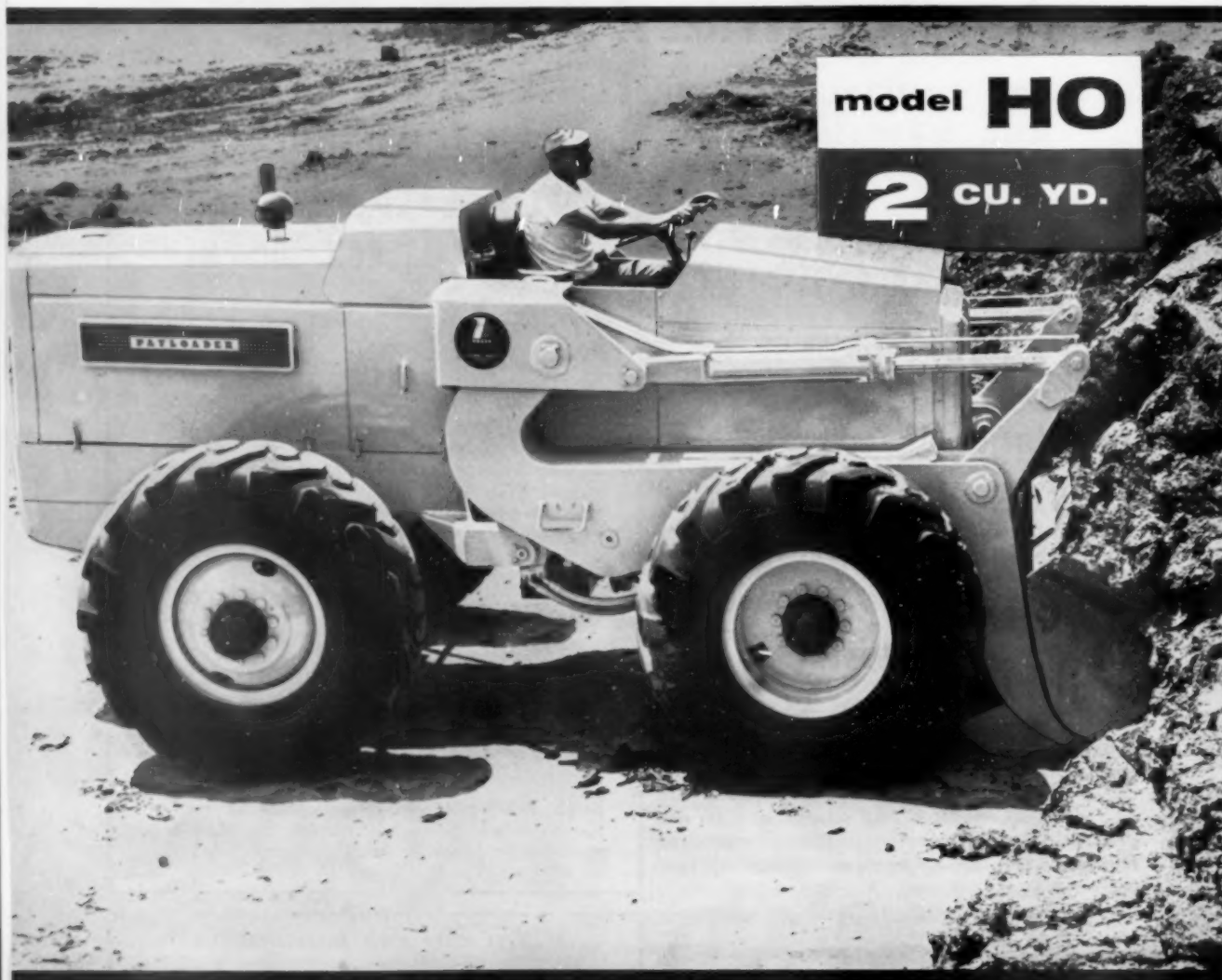
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ANOTHER COMPLETELY NEW **PAYLOADER®**

Biggest Yardage Producer In Its Class



model **HO**

2 CU. YD.



COMPLETE Power-Shift Transmission

Makes ALL Shifts WITHOUT Stopping!

This "PAYLOADER" has a newly-developed power-shift transmission which is the easiest-operating, fastest-acting, most efficient ever put into a tractor-shovel. Shifting from *any* speed range to *any* other is accomplished instantaneously by fingertip action — *on the go* — there's no stopping, no "clutching". Direc-

tional shift (forward and reverse) is just as easy and just as fast. All speed ranges are provided in reverse as well as forward. Also included is a highly-efficient polyphase torque-converter that matches engine speed and torque to the load *instantly* and multiplies the engine torque up to 350%.

- with more digging power
- with faster operating cycles
- with easier, safer operation

YOU'VE never seen anything like this big new "PAYLOADER" — because there *is* nothing else like it. Nothing else like it in design — nothing like it in performance.

No other tractor-shovel gives you the tremendous digging power; the ability to get and keep heaped bucket loads under all conditions; the *complete* power-shift transmission which speeds operating cycles; the balance and stability to handle big loads fast, safe and easy.

If you want big, steady output — dependable performance hour after hour, put this husky HO on your jobs and you'll see the difference. Stop in at your nearest "PAYLOADER" Distributor and look it over.

HOUGH-DESIGN HOUGH-QUALITY

Safety and Stability. Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

More Horsepower per bucket capacity than other standard models. Either gasoline or diesel power available.

Easy to Operate. Fullst operator visibility for safe, fast maneuvering; power steering; power-shift — no "clutching"; 4-wheel hydraulic brakes — vacuum boosted; foam rubber molded seat and back cushions; seat adjustable for operator comfort; longer wheelbase adds to rider comfort.

Superior Hydraulic System. Sealed, pressure-controlled hydraulic system to keep dirt and air out of oil; double-acting, long-life hydraulic rams with chrome-plated piston rods, and highest quality oil lines and fittings.

Fully-Equipped. Standard equipment includes: built-in headlights, back-up lights and tail lights; 12 volt electrical system for gas-powered units.

Extra Equipment for Greater Usefulness. Bulldozer blade, special buckets, bucket teeth, crane hook and lift fork attachments; snow plows, backhoes and many other useful and special accessories will be available.



PAYLOADER®

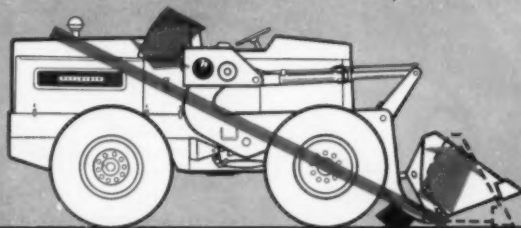
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

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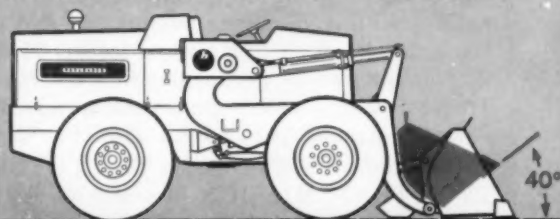
POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



40° BREAK-OUT AT GROUND LEVEL

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS — because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.



THE FRANK G. HOUGH CO.

768 Sunnyside Ave., Libertyville, Ill.

Send full information on the new Model HO, 2-cu. yd. "PAYLOADER"

NAME

TITLE

COMPANY

STREET

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A New, Time-Saving Experience is Yours with the **Tractomotive TL-12 TRACTO-LOADER**



Our long experience building the famous Tracto-Shovels serves us well in manufacturing our line of wheel loaders. We know the time-saving advantage of the hydraulic torque converter drive from working with it in crawler tractors . . . and we know how to apply it to a wheel loader. That's why you get smooth, fast loading with the TL-12 Tracto-Loader — no slow, mushy starts and stops — torque is multiplied **THREE TIMES!**

Tractomotive also developed the **CLUTCH-TYPE TRANSMISSION** in wheel loaders — saves gear shifting . . . operator just pulls a lever to change direction.

In addition to these time-saving advantages, you get a **TIP-BACK BUCKET** which gives you a "scooping action" to further speed loading. This feature also enables you to carry a full bucket at a lower position — means greater stability, easier maneuvering, better visibility.

There is **4-WHEEL DRIVE** for excellent traction and **POWER STEERING** for easy handling under all operating conditions . . . plus high lift and long reach, strong, pin-connected axles, unit assembly of major parts—many performance and service features that save time and money.

It's the combination of advantages that makes the TL-12 an outstanding excavator-loader . . . but the best way to size it up is to see it in action, on your job, under your operating conditions. You will be in for a new, time-saving experience.

***The Latest in Loaders...
By the Leader in Loader Design***

- 1½-cu-yd Bucket • Weight 12,100 lb
- 63 Brake hp

Sold and Serviced by your Allis-Chalmers Industrial Tractor Dealer

TRACTOMOTIVE TRACTOMOTIVE CORPORATION
DEERFIELD, ILLINOIS

Tracto-Loaders • Tracto-Shovels • Side Booms and Hydraulic Rippers for Allis-Chalmers Crawler Tractors
• Loader and Shoulder Maintainer for Allis-Chalmers "D" Motor Grader

... for more details circle 235, page 1

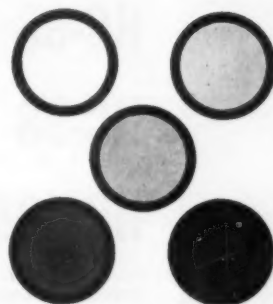
HOW TO PREVENT GLARE on air-entrained concrete roads

Glare on untreated concrete increases driver fatigue and road hazard . . . reduces visibility.

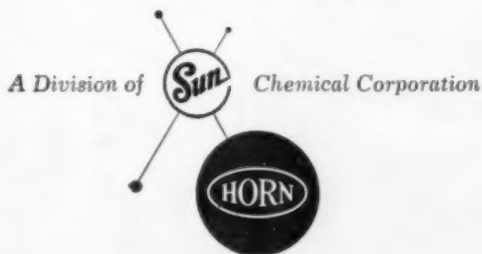


AE Dispersed Black makes concrete roads glare-free . . . improves visibility.

Unlike most "blacks" available, Horn AE Dispersed Black will not absorb or neutralize the air-entrainment in a concrete mix. It does not affect the resistance of the concrete to scaling. Horn AE Dispersed Black eliminates glare and, by heat absorption, assists more rapid de-icing. Horn AE Dispersed Black improves highway safety and appearance, winter and summer.



Wide range of shades, from light to dark, obtainable by mixing at job.



A. C. Horn Co., Inc.

Manufacturers of materials for building maintenance and construction since 1897.

DIVISIONS OF SUN CHEMICAL CORPORATION

HORN • HUDSON • WILLEY (paints, maintenance and construction materials, industrial coatings) • **WARWICK** (textile and industrial chemicals) • **WARWICK WAX** (refiners of specialty waxes) • **RUTHERFORD** (lithographic equipment) • **SUN SUPPLY** (lithographic supplies) • **GENERAL PRINTING INK** (Sigmund Ullman • Fuchs & Long • Eagle • American • Kelly • Chemical Color & Supply Inks) • **MORRILL** (news inks) • **ELECTRO-TECHNICAL PRODUCTS** (coatings and plastics) • **PIGMENTS DIVISION** (pigments for paints, plastics, printing inks of all kinds)

. . . for more details circle 199, page 16

ROADS AND STREETS, August, 1955

FREE INFORMATION!

A. C. Horn Co., Inc., Dept. H3-88
Long Island City 1, N. Y.

Please send me "Highway Safety with AE DISPERSED BLACK."

Name _____ Title _____

Firm Name _____

Address _____

City _____ State _____

Announcing a complete line **LINK-BELT SPEEDER**

5 MODELS
12½ to 35 ton capacities
with power-hydraulic control

HC-58

12½ ton
capacity.

HC-68

17½ ton capacity.
Remote control
available.

HC-88

25 ton
capacity.

HC-98

30 ton
capacity.

HC-108

35 ton
capacity.

**crawler-mounted
shovel-cranes...**

19 sizes from ½ to 3 yd.,
8 to 60 ton capacities.

**wheel-mounted
shovel-cranes...**

6 sizes from 12½
to 35 ton capacities.

of new, advanced-design Truck-Cranes

Zephyrcranes

The new line of Link-Belt Speeder truck-mounted Zephyrcranes features Speed-o-Matic—the true power-hydraulic control system. Fingertip-operated, this Link-Belt Speeder exclusive provides fast, easy, positive response, perfect “feel” for speed with accuracy. And because it greatly reduces operator fatigue, keeps him alert . . . you increase safety and your operator is able to maintain greater output with less effort.



Check these features

- **SPEED-O-MATIC REVERSING CLUTCHES** are available for either or both main drums . . . provide power load lowering of main hoist line and jib whip line.
- **THIRD DRUM** available for HC-88, HC-98, HC-108, is valuable for piledriving applications.
- **SELF-COMPENSATING CLUTCHES** adjust for heat and normal lining wear.
- **ALL CLUTCHES ARE INTERCHANGEABLE** (within each model) with exception of front drum reversing clutch on HC-58 and HC-68.
- **INDEPENDENT, RAPID BOOMHOIST** with power raising and power controlled lowering through Speed-o-Matic boomhoist and lowering clutches is standard on HC-88, HC-98 and HC-108. Available for the HC-58 and HC-68.
- **PATENTED RETRACTABLE HIGH GANTRY** is quickly raised or lowered under power. Raised, it reduces stresses on boom and boomhoist cable. Standard except on HC-58 and HC-68.

MOUNTED ON SPECIALLY DESIGNED CARRIERS

Zephyrcrane carriers are advance-designed, offer many features including:

- ✓ Removable rear outrigger.
- ✓ Full floating walking beam support for rear wheels.
- ✓ Screw-type outrigger jacks and pontoons, available.

- **GREATER “NET” HORSEPOWER.** Heavier components plus use of anti-friction bearings, splined-shafts and precision-machined parts permits converting more rated engine power into usable (net) horsepower or actual line pull.
- **COUNTERWEIGHT REMOVAL DEVICE** using Speed-o-Matic hydraulic jacks, speeds removal and installation of counterweight. Available on HC-88, HC-98 and HC-108 only.
- **HYDRAULICALLY CONTROLLED SWING BRAKE** — Standard on HC-88, HC-98 and HC-108.
- **FULLY CONVERTIBLE** to all standard front end attachments.
- **REMOVABLE REAR OUTRIGGER** permits easy, quick changeover for shovel, hoe or drag-line operations.
- **TORQUE CONVERTER** power units available.



For complete details contact your distributor or write direct. Be sure you get the free 12-page booklet “The Inside Story” . . . for full facts on why Speed-o-Matic cuts costs, boosts output up to 25% or more.

LINK-BELT SPEEDER

Link-Belt Speeder Corporation, Cedar Rapids, Iowa

Builders of a complete line of crawler and rubber-tired shovel-cranes

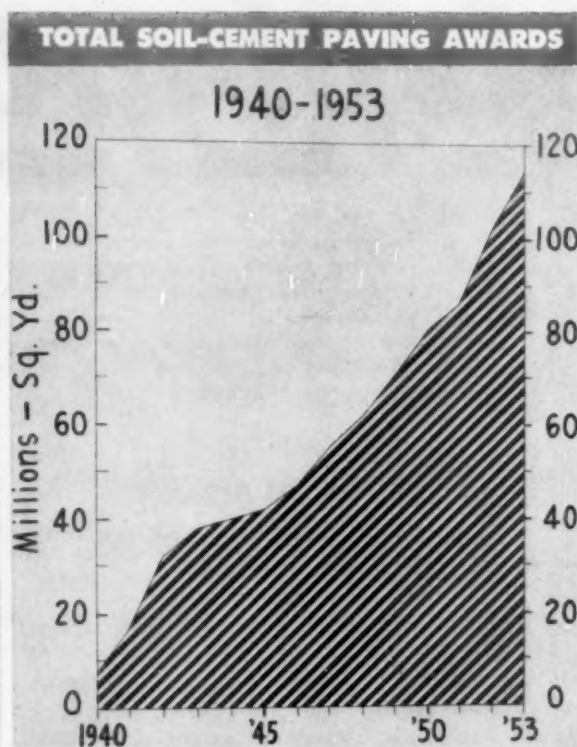
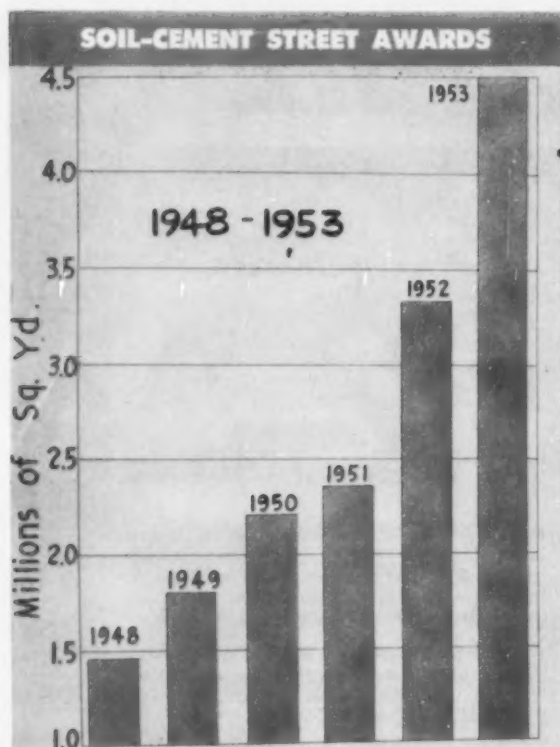
. . . for more details circle 213, page 16

ROADS AND STREETS, August, 1955

13,000

Soil Cement Is Climbing Fast

As Base Course for Streets, Roads and Airports

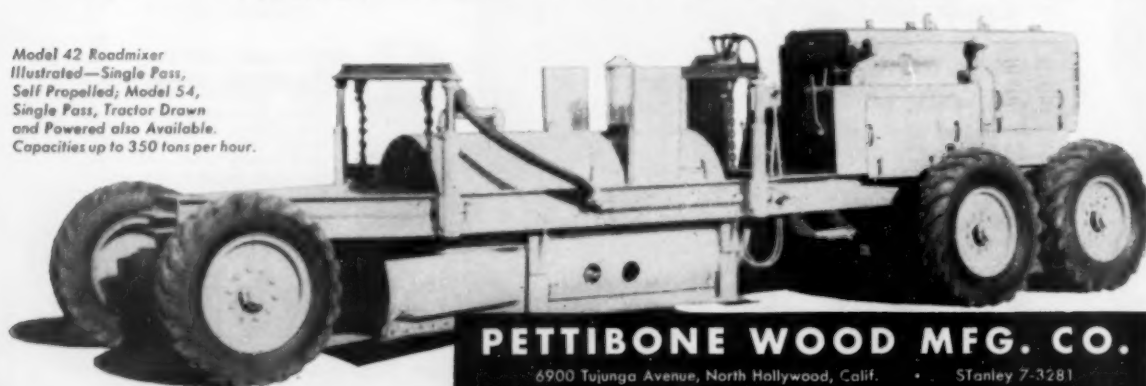


Most Soil Cement Is Mixed With Pettibone Wood Mixers

Average soil cement bid prices range from 80 to 90 cents per square yard. A soil cement base course resists moisture, erosion and pumping action of concrete

slabs. It virtually eliminates vertical displacement and nullifies plasticity. It substantially prolongs the life of other surfaces, too. Write for informative case histories.

Model 42 Roadmixer
Illustrated—Single Pass,
Self Propelled; Model 54,
Single Pass, Tractor Drawn
and Powered also Available.
Capacities up to 350 tons per hour.



PETTIBONE WOOD MFG. CO.

6900 Tujunga Avenue, North Hollywood, Calif.

Stanley 7-3281

Subsidiary of FETTERBONE MULLIKEN CORP., Chicago, Illinois



Keep that Gravel Grounded !

Stabilize your roads with Morton Salt

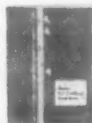
- Cut aggregate loss
- Save man-hours and maintenance money
- Reduce accidents caused by loose gravel

Gravel roads stabilized with Morton Salt give more service per dollar than roads built by any other method. (Savings in aggregate alone more than pay for the salt.) You get smooth, durable, water-repellent surfaces that require minimum maintenance.

Stabilizing the base course of primary roads with Morton Salt helps prevent the 9 out of 10 road failures which result from faulty foundations.

... for more details circle 217, page 16

ROADS AND STREETS, August, 1955



Send for this free book on how
Morton Salt helps you build
better roads at far less cost!
Mail this coupon today!

MORTON SALT COMPANY


Industrial Division, Dept. RS-8
120 So. LaSalle Street, Chicago 3, Illinois
Please send me your free booklet on salt
stabilized roads.

Name _____

Title _____

Address _____

City _____ County _____ State _____



ANYTIME...ANYPLACE!

There's just one big reason why you see so many dependable Homelite gasoline engine driven pumps on the job today. They can be put to work quickly with the minimum of time and effort. Only one man is needed to carry the complete unit to the best pumping location.

There are many other good, money saving reasons why you should put a Homelite pump on your job. Ask your Homelite dealer for a free demonstration or write us for information.

HOMELITE CORPORATION

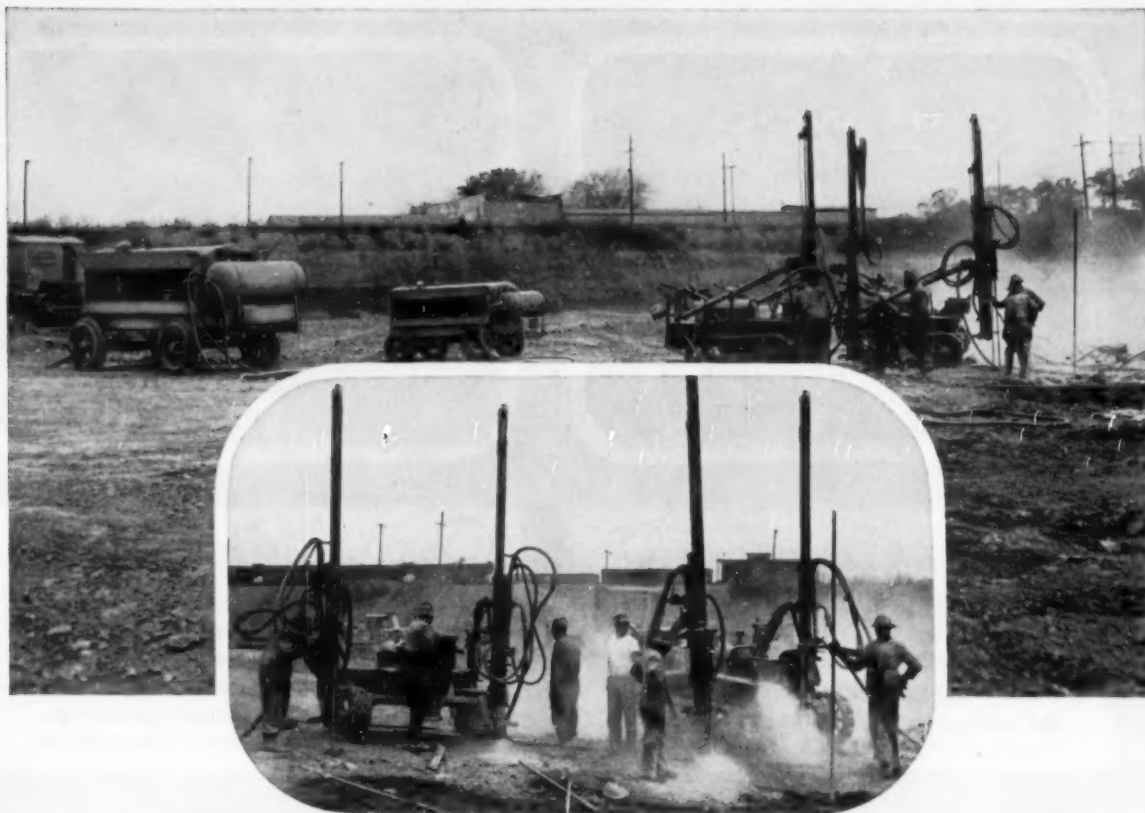
7008 RIVERDALE AVENUE • PORT CHESTER, N. Y.

PROJECT: Nyack-Tarrytown Bridge

CONTRACTOR: Construction Aggregates Corp.

... for more details circle 198, page 16

ROADS AND STREETS, August, 1955



High Speed Sewage Disposal Team

Le Roi Compressors and Cleveland T-286 Mobile Drill Rigs provide flying start for Alabama project

Ordinarily you wouldn't think that air compressors and rock drills had anything to do with sewage disposal plants.

But this plant had its origin in solid bed rock — and the contractor on the job used Le Roi portables and Cleveland Mobile Drill Rigs to solve the situation.

The portables were Le Roi 600's. They were selected for their dependability and economy — which they proved by supplying 600 cfm of air — day in and day out.

The Cleveland T-286 Mobile Drill Rigs further cut costs. Basically the T-286 rig consists of a 25-hp

tractor with two Cleveland patented air feeds, 4" drifters, and air-motor booms mounted on a specially-constructed front-end base. The booms swing in a 220 degree arc so that you can get any hole pattern you want. Because the T-286 gives you faster set-ups, better hole spacing, greater footage, faster drilling, greater mobility—because you can drive it anywhere and get better fragmentation — you get lower costs.

You get the whole story on Le Roi Portables and Cleveland T-286 Drill Rigs from our literature. Just write for your copies.

LE ROI



Division of Westinghouse Air Brake Co.

Milwaukee 14, Wisconsin



PORTABLE AIR COMPRESSORS



TRACTOR



STATIONARY AIR COMPRESSORS



AIR TOOLS



ENGINES

NATION-WIDE SALES-SERVICE NETWORK

ALABAMA: Birmingham — ARIZONA: Phoenix — ARKANSAS: Harrison, Little Rock — CALIFORNIA: Bakersfield, Berkeley, Fresno, Los Angeles, Redding, San Francisco — COLORADO: Denver, Grand Junction — CONNECTICUT: Hartford — DELAWARE: Dover — FLORIDA: Jacksonville, Miami, Tampa — GEORGIA: Atlanta, Augusta — IDAHO: Boise, Idaho Falls, Sioux Falls, Twin Falls, Wallace — ILLINOIS: Chicago — INDIANA: Indianapolis, South Bend — IOWA: Cedar Rapids, Des Moines, Sioux City, Waterloo — KANSAS: Kansas City, Wichita — KENTUCKY: Lexington, Louisville, Madisonville — LOUISIANA: New Orleans, Shreveport — MAINE: Augusta — MARYLAND: Baltimore, Hyattsville — MASSACHUSETTS: Hyde Park, Worcester — MICHIGAN: Detroit, Grand Rapids — MINNESOTA: Duluth, Minneapolis — MISSISSIPPI: Jackson — MISSOURI: Joplin, St. Louis, Springfield — MONTANA: Billings,

Great Falls — NEBRASKA: Lexington, Lincoln, Omaha — NEVADA: Reno — NEW HAMPSHIRE: Manchester — NEW JERSEY: Cranford, Kingston — NEW MEXICO: Albuquerque — NEW YORK: Albany, Binghamton, Buffalo, Massena, Rochester, Saugerties, Syracuse, Whitesboro, Woodside (L. I.) — NORTH CAROLINA: Charlotte — NORTH DAKOTA: Grand Forks — OHIO: Cincinnati, Cleveland, Columbus, Dayton, Toledo — OKLAHOMA: Oklahoma City, Tulsa — OREGON: Portland — PENNSYLVANIA: Harrisburg, Philadelphia, Pittsburgh, Wilkes Barre — RHODE ISLAND: E. Providence — SOUTH CAROLINA: Columbia — SOUTH DAKOTA: Sioux Falls — TENNESSEE: Chattanooga, Knoxville, Memphis, Nashville — TEXAS: Beaumont, Dallas, El Paso, Houston, Lubbock, Midland, San Antonio — UTAH: Salt Lake City — VIRGINIA: Richmond, Roanoke — WASHINGTON: Seattle, Spokane — WEST VIRGINIA: Clarksburg, South Charleston — WISCONSIN: Green Bay, Milwaukee — WYOMING: Casper.

... for more details circle 210, page 16

ROADS AND STREETS, August, 1955

C-158

GAR WOOD
Presents
EQUIPMENT
THAT
SUITS THE JOB



... The Gar Wood '75' line of $\frac{3}{4}$ yard excavators, in both standard and heavy-duty models and 20-ton truck crane, have ably and economically handled a wide variety of jobs. Check the many Gar Wood advantages before placing *any* order!

Quarry work...

Gar Wood's independent travel while swinging permits faster moves away from rock slides to increase safety factor. Drop ball can operate from second drum without hooking to bucket teeth. Less wear and tear because fluid coupling operates to meet varied rock conditions.



Sand and Gravel...

Full dippers and fast loading pay off on sand and gravel work. Gar Wood's positive independent chain crowd gets full engine power into the load — dipper retracts at twice the crowd speed. Power actuated drum clutches cut operator fatigue — get more tons loaded per day.



Concrete work...

Concrete work requires the same smooth, precision operation necessary on steel erection and a Gar Wood '75' can position buckets to perfection. The 75BT, heavy-duty truck crane, is extremely mobile — both on the job and on moves from job to job—saves time, cuts costs!



Steel Erection...

Boom lengths up to 30', with tip extension if required. Optional fluid coupling, power operated drum clutches and direct drive with optional power load lowering, combine to permit smooth, precision work. Truck crane has folding boom for quick, easy moves in traffic.



Drainage Canals...

Faster swings, smoother operation, *plus* self-cleaning crawlers for marshy terrain, add up to more work daily when used as dragline or clam. Low-mount, back-hitch gantry offers all the advantages of high gantry when long crane booms are needed for extra long reach.



ASK FOR A
DEMONSTRATION

GarWood

**SHOVELS-CRANES
TRENCH HOES**

Foundation Borer...

Only Gar Wood offers this new, profit making tool! Combines boring and belling into one streamlined operation for low cost construction of unreinforced foundation footings, caissons, piers, piles, wells, wall supports, etc. Factory installed to order. Completely convertible.

... Distributors throughout the country will gladly show you how Gar Wood performance puts profits in your pocket!

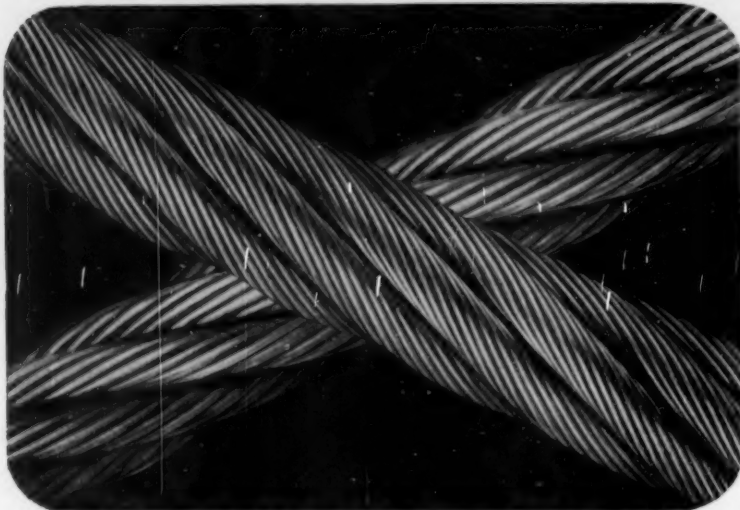
GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

No. 551

... for more details circle 191, page 16

ROADS AND STREETS, August, 1955

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue



WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

Contact your Roebling distributor or write us for the full story.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation



JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3353 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 331 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

... for more details circle 248, page 16



NEW PROFIT BOOSTERS IN THE LORAIN 50

As you read about these newest profit-boosters, remember, they are important additions to the tried and proven features of 1-yard Lorain-50 crawler shovels and cranes . . . such as these leading design advantages: "never-die, can't stall" hydraulic coupling power take-off . . . Center Drive power distribution — power when and where you want it . . . sloping machinery frame that balances working weight for most effective "live counterweight" . . . fingertip air power controls . . . anti-friction bearings . . . your choice of 4 crawlers—including the new long, wide "K-6" crawler beneath the new 25-ton crane.

Your next 1-yard shovel-crane is not up-to-date without these important Lorain design advances!

FEATURES FOR GREATER OPERATING EASE, INCREASED PRODUCTION, REDUCED MAINTENANCE

NEW

OPERATING LEVERS AND LINKAGE . . .

Cuts operating effort in half. When optional air assist is added, even less effort is required.

NEW

AIR OPERATED DIPPER TRIP . . .

Now air-controlled by convenient push-button on swing lever . . . almost effortless operation.

NEW

IMPROVED HOIST DRUM DESIGN . . .

Now mounted on roller bearings, new clutch drum design for cooler operation.

NEW

EASIER, FASTER HOIST CLUTCHES . . .

Now use pre-loaded springs on live ends, plus increased toggle action. Easier operation, less adjustment.

NEW

IMPROVED CAB FOR OPERATOR COMFORT . . .

Weatherproof; improved vision; overhead window; roller-slide windows; comfortable seat.

NEW

25-TON CAPACITY CRANE ON "K-6" CRAWLER

NEW

LONG, WIDE "K-6" CRAWLER . . .

14-ft. long, 11-ft. 4-in. wide — 30 in. treads. Hardened roller path and teeth and driving rollers. Full air control of steering and tread lock.

NEW

EASILY REMOVABLE COUNTERWEIGHT . . .

Counterweight is quickly removable for highway transportation. No load limit worries.

NEW

TUBULAR CRANE BOOM . . .

Stronger, lighter, increases lifting capacities; permits longer booms, pin connected.

THE W LORAIN

THE THEW SHOVEL CO., LORAIN, OHIO

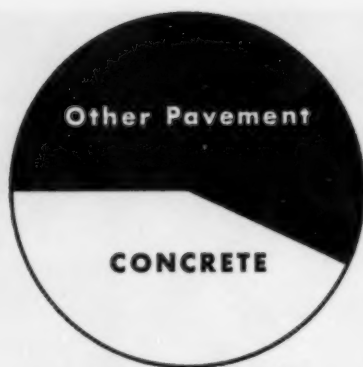
YOUR NEARBY THEW-LORAIN DISTRIBUTOR IS
READY TO GIVE YOU FULL FACTS ON THE "50"

. . . for more details circle 232, page 16

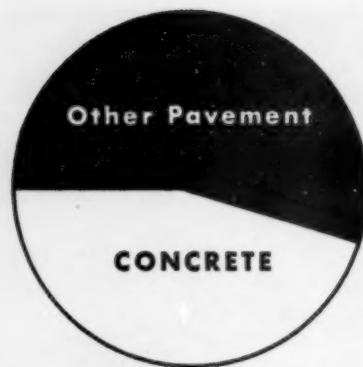
ROADS AND STREETS, August, 1955



ALL ACCIDENTS



FATAL ACCIDENTS



PROPERTY DAMAGE



ACCIDENTS DUE TO SKIDS



ACCIDENTS ON DRY ROADS



ACCIDENTS ON WET ROADS

2 BILLION MILE ACCIDENT STUDY IN NORTH CAROLINA PROVES CONCRETE IS SAFER

An analysis of official 1953 North Carolina highway accident records shows conclusively that the type of pavement affects accidents. Covering more than two billion miles of travel and 6000 accidents on the state's heavily traveled roads, the study included 433 miles of concrete and 1152 miles of the other most commonly built pavement.

The results prove that concrete is far safer. *For equal vehicle miles* the other pavement accounted for:

- 24% more accidents
- 32% more fatal accidents
- 22% more property damage
- 67% more accidents due to skidding
- 18% more accidents on dry roads
- 46% more accidents on wet roads
- 23% more daytime accidents
- 29% more nighttime accidents

Safety is built into concrete with a gritty, highly skid-resistant surface. When wet it retains $\frac{3}{4}$, the other pavement only $\frac{1}{2}$, of its dry coefficient of friction at 40 mph.

Concrete's light color reflects about 20%, dark pavement only about 5%, of headlight illumination. The tremendously significant difference in visibility is well known to drivers at night, when most accidents occur.

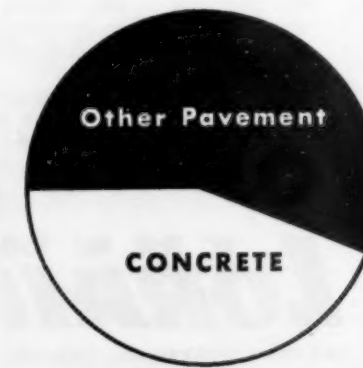
Highway users expect safe roads. Concrete pavement makes the safest roads. For more information write for free, illustrated literature. It is distributed only in U.S. and Canada.

Portland Cement Association
Dept. A8-28, 33 W. Grand Ave., Chicago 10, Ill.

A national organization to improve and extend the uses of portland cement and concrete... through scientific research and engineering field work



DAYTIME ACCIDENTS



NIGHTTIME ACCIDENTS

ROADS AND STREETS, August, 1955



1-yd. MICHIGAN takes a heaping bucket-load . . .

The bonus in the bucket pays for this machine fast!

Take another look at the bucket in the photograph. It shows a typical MICHIGAN* bucket-load, heaped-up well over the rated capacity of the bucket—nearly a 50% bonus. Translate this bonus into your daily production and you'll see why a MICHIGAN Tractor Shovel pays for itself fast: you simply move more material with a MICHIGAN.

Tremendous digging ability. Get the bucket blade into hard-to-dig material or under a heavy obstacle and "work" the bucket until you've got a heaping load. The two double acting bucket cylinders are actually powerful enough (if the blade is under an immovable object) to pull the back wheels off the ground! We'll match the MICHIGAN'S digging ability against any make

or type of Tractor Shovel, bar none.

Low-level bucket action. You can roll the bucket back only a few inches off the ground—heaping bucket-loads even when the material is scattered only a few inches high. And you can carry the full load *low*—your driver can see where he's going, he doesn't have to travel *backwards*.

No clutch—faster cycles. There's no clutch pedal on a MICHIGAN. You can actually shift between Forward and Reverse *while moving*: simply push the hand-lever on the steering column—MICHIGAN'S power-shift transmission shifts instantly. Power-shifting saves time and energy every cycle. Your operators will say: "This

sure beats riding a heavy-duty clutch all day!"

See it in action—on your own job. Write us and we'll arrange a demonstration. MICHIGANs are built to handle jobs too tough for other rubber-tired Tractor Shovels—*let us prove it*, without obligation. Write for details on the pay-as-you-go MICHIGAN Lease Plan—you can put these machines to work without laying out a penny of capital.

CLARK EQUIPMENT COMPANY
Construction Machinery Division
394 Second Street
Benton Harbor 27, Michigan
Phone WA 6-6184

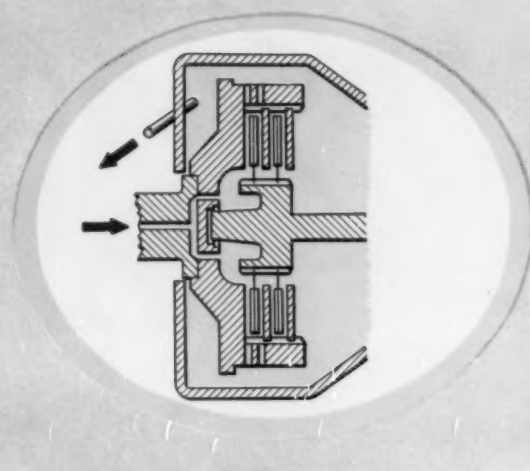
**CLARK
EQUIPMENT**

*A Trademark of Clark Equipment Company

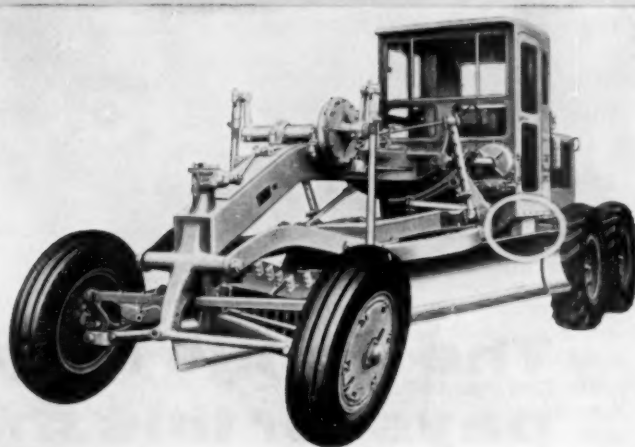
. . . for more details circle 173, page 16

**CATERPILLAR ANNOUNCES
ANOTHER "FIRST":**

NEW OIL CLUTCH for the NO. 12 MOTOR GRADER



Arrows show path of oil through housing with clutch disengaged. Facings remain cool and bathed in oil, which is carried to outlet at top by flywheel ring gear. The two steel clutch discs and clutch brake are faced with pressure-processed cork, which gives an excellent coefficient of friction and long wear.



The new oil clutch for the No. 12 Motor Grader gives you the same reliability and improved performance as the thoroughly job-proved oil clutch in Caterpillar track-type Tractors. Rugged and reliable, it uses oil from the engine lubrication system. Here are some of the things the new oil clutch for the CAT* No. 12 can mean to you:

LONGER WORK LIFE—In actual on-the-job tests, clutch facings wear less than the thickness of a human hair in one thousand hours' operation! Thick clutch facings mean that work life is extended thousands of hours before discs need be replaced. And constant "oil bath" lubrication reduces wear on all moving parts.

LESS MAINTENANCE—Adjustment every 1500 hours is not unusual, after initial "break in." This is equivalent to nearly nine months without ad-

justment on road maintenance work! No external lubrication is needed: internal oil system lubricates pilot and throwout bearings.

GREATER EFFICIENCY—The clutch is constantly cooled, never exceeding normal engine oil temperature. This practically eliminates clutch fade, greatly reduces slippage due to overheating, and means that the clutch retains "like new" operation for thousands of hours.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Cat and Caterpillar are Registered Trademarks of Caterpillar Tractor Co., U. S. A.

**99% OF ALL
CAT MOTOR GRADERS
ARE STILL IN USE**

Paving Speed Record Set

IN WIDENING JERSEY PARKWAY

Third lane completed on 13½-mile section of Garden State Parkway in an intensive seven-week push. By placing concrete under flood lights, contractors won bonus and met deadline in time for summer week-end traffic peak.

THE concrete pavers began at midnight on this project, and everything else was geared up accordingly. The scene was the Garden State Parkway — the old toll-free section, built by the state, which extends between U.S. 22 and the Raritan River. The contractors were Villa Contracting Co., and their associated company, Weldon Contracting Co., both of Westfield, N.J. The time was the month of June, when this unique widening job hit its peak.

The contractors, spurred by a bo-

nus of \$1,000 per day for beating the target date, averaged 5,080 lineal feet of 8 in. by 12 ft. portland cement concrete per working day. Their peak of 7,980 ft. is believed to represent a new world's record for paving footage for a single 24-hour period with one finishing train.*

The widening project had been on the docket for some time, because of

*A 7,260-ft. day of 12-ft. lane placement, by V. N. Holderman & Sons, Inc., on the Ohio Turnpike, was reported in *ROADS AND STREETS*, November, 1954.

- Dumpcrete delivery of concrete mixed in transit mixers used as a "stationary" plant, were among unusual methods seen on Garden State Parkway widening project completed this summer.





● Third paving lane was placed on inner side of the wide median. Here earthmoving equipment is trenching for the widening.

serious traffic bottlenecks developing along this 4-lane-divided section of the Parkway. Governor Robert B. Mayner in early spring conferred with state highway commissioner Dwight R. G. Palmer and state highway engineer Edward W. Kilpatrick, who said that the job could be done in 60 days, or in time to relieve summertime traffic peaks expected. Approval by the Bureau of Public Roads was sought for federal aid, and without waiting for this OK the state went ahead with construction plans, setting a speed record for the necessary engineering. Meanwhile the Bureau also approved the project in an unprecedented 5-day interval.

On May 20, bids were taken, and on the same day the job awarded to Villa Contracting Co. on their low bid of \$1,750,000. Villa moved in on May 23, began placing concrete on June 2, and placed the last paving concrete in time for opening all lanes July 9 except those closed off temporarily for shoulder and clean-up operations. The work accomplished in

this brief period of design and construction would ordinarily have taken many months.

The contractor in this short time ripped up the existing shoulders, performed necessary grading, installed drainage, completed 75,000 cu. yd. of roadway excavation, placed 50,000 cu. yd. of granular (pit run) subbase for the new lane, placed 175,000 sq. yd. of concrete, and made a good start on the 50,000 sq. yd. of penetration macadam and hot-mix surfaced shoulder. There were 67 bid items in all, emphasizing that even the simplest dual-highway widening job entails many complications, such as ramp widening, setting back of curbs, modification and extension of drainage, etc.

Villa crewmen began at the north end at U.S. 22 junction, working through the 13½ miles on one side and back on the other. First came topsoil removal and stockpiling, which was done with motor graders and tractor-shovels, the topsoil being merely shoved aside in the clear.

This work, which moved ahead at about 8,000 ft. per day, was followed closely by the grading. Old shoulder stone was ripped up with teeth mounted on a motor grader or roller. Scrapers, dozers and motor graders excavated a 16-in.-deep "box" or trench for the 12-ft. widening. The tractor-shovels loaded spoil material into 10-wheeler trucks for disposal.

Portable Truck Ramp

Drainage crews worked on ahead, took care of extensions to underdrains and other details required at this stage. Existing utilities also were moved in advance where necessary.

Next came trench filling with sub-base material, which was hauled an average distance of 14 miles and spread with a Jersey spreader mounted in front of a Caterpillar D8 tractor. Reflecting the constant effort to discover shortcuts and minimize traffic hazards during the work, the Villa men devised a portable truck ramp onto which the gravel trucks backed from the pavement to facilitate dumping. This ramp consisted of a platform made from 12-in. steel I-beams and 3-in. hardwood planking. It was towed along by a Caterpillar D4 tractor immediately ahead of the spreader.

By using this device instead of building an earth ramp into the trench at 500 ft. intervals or so, the contractor saved labor greatly speeded up truck delivery and assured a top rate of progress for the large-capacity spreader.

For most of the distance, the third lane was built on the median side of the existing pavement, and requiring a minimum of grading and disturbance of drainage structures. At some locations, however, it was found more feasible to widen on the outer side.

The subbase was processed in a single 8-in. compacted lift, using an International and a Jackson vibrating tamper. No rollers were employed at this stage, which also progressed at

● Scarifying old shoulder material, and loading it for disposal. Loaders played major role in the project.





● A towed platform, kept immediately ahead of the spreader, saved truck haul, and obviated earth ramps. Jersey spreader placed subbase material.

about 1½ miles per day. Grading and subbase preparation were kept about three miles ahead of the concreting.

A total of 3½ miles of forms were used in various parts of the job, forms being set off by a truck crane from a low-bed trailer, tamped and pin-set mechanically, as on an ordinary road job. A towed grade "log" was followed by a mechanical subgrader.

The subbase was given a final rolling by various means after striking off. The contractor finally settled on his own device, consisting of a train of five garden-type steel rollers, mounted on two axles, and towed by the finegrader.

Perhaps most noteworthy among the methods on this project was that of concrete placement. This was done at a speed said to be 20 percent faster than by alternate methods considered and with minimum traffic disturbance along the job. The key was the mix-

ing of concrete in six to eight 8-yd. transit mix trucks, which dumped into 4-yd. Maxon Dumpcrete trucks for delivery to the job. The mixer trucks were batch-loaded at a stationary plant, located midway along the project. As each truck was loaded, it began mixing and circled onto a platform, where it discharged into the Dumpcrete bed and went back for another batchload.

During the concrete placement operation the adjacent traffic lane was blocked off, giving space for truck delivery. Concrete was deposited on the subgrade usually in a work area extending far enough ahead to permit two or three trucks to dump simultaneously without waiting.

Two mechanical spreaders and three finishers (Heltzel, Jaeger and Blaw-Knox) were followed by standard hand finishing procedures, burlap drag, and membrane curing cover.

While the grading and other preliminary work was done on a one-shift basis, the concreting was geared to two shifts. Placement began at midnight. The second shift took over in the forenoon and worked through until 8 p.m., the finishers working into darkness. An estimated one thousand flood lights mounted on the spreaders and finishers or on portable lighting rigs, were employed to expedite the paving.

The pavement, by the way, consisted of a normal air-entrained portland cement mix, with entraining material added while mixing. No distributed reinforcement was used. Dummy joints were placed every 20 ft., matching the joints in the adjacent pavement.

After the July 10 deadline for paving was met, the contractors still had to complete the shoulders and clean



● Jackson vibratory ramper consolidating subbase for the third lane.

up. The 3-ft. shoulder consisted of an 8-in. penetration base and 2-in. asphaltic concrete surface. Working along one side of the project and back on the other, at a rate sometimes exceeding two miles per day, the shoulder operations were as follows:

Trenching was done by means of a special under-cutting box-type blade on a Michigan tractor-shovel, followed by a clean-up pass with a Caterpillar 12 motor grader using a special drop-blade section bolted on the standard blade. The subgrade was compacted with a vibratory tamper. Crushed stone for the 8-in. penetration course was placed with an Apsco spreader, followed by a Buffalo-Springfield trench roller.

Then 2.3 gal. per sq. yd. of A04 asphalt was applied with an Etnyre distributor. Asphaltic concrete was laid in a single course using an Apsco wid-



● Two or three trucks at a time dumped ahead of the spreaders.

- Transit mixers mixed concrete on platforms located near the batch plant, and dumped into the Dumpcrete-Ford truck units for delivery to the job.



ening paver, followed by a 5-ton tandem Galion or Ingram roller. This sequence of operations was conducted skillfully, care being taken to trench as neatly as possible so that a shoulder of supporting earth would be present during placement and rolling.

The Villa firm turned the concrete end of the work over to Weldon. Between them the two organizations at the peak were moving 8,000 cu. yd. of excavation and subbase materials per day, while simultaneously placing as high as 2,550 cu. yd. of concrete.

Coordination of the work was greatly aided by radiotelephone; as many as 25 of Villa's cars and trucks were equipped with General Electric units in contact with company headquarter's office, shop and batch plant.

The contractors give special credit to the heavy tractor-shovels or front-end loaders and scoops, which were

major factors at almost every step. These units consisted of a D6 Caterpillar, a Michigan, an Allis-Chalmers HD-15 and an HD-20.

Flagmen for the job were recruited from the police force of Westfield and other nearby communities. Flagmen were required to wear uniforms. Their experience in handling traffic proved invaluable in minimizing traffic tie-ups and protecting workers and motorists.

According to a Portland Cement Association spokesman the contractors obtained good surface trueness and careful joint construction despite the speed.

Commissioner Palmer praised the state highway department staff for its part in this speedy job, in particular citing Edward Kilpatrick, state highway engineer; Neil McDougall, con-

struction engineer; C. V. Vanderhoff, principal engineer; and Leo LeJambre, chief inspector.

Villa Contracting Company was represented by the four Villa brothers (Angelo, George, Quinky and Joseph) in an executive capacity and Roger J. Morra, chief engineer. Robert and Norbert Weldon were in charge for Weldon Contracting Company.

Examples on bid variations on recent contracts

How violently bid prices have fluctuated in some states in the last two years is shown by figures published by the Virginia Road Builders Association for its member contractors.

According to the records of the Virginia Department of Highways, construction costs have fallen from the 1952 peak of 260 to a level equal to 205 on the same scale; 1937-40 being 100. The bid price on excavation reached a low point (average) of 25 cents in 1940; a peak point in 1952 of 77 cents and by 1954 had declined to 48 cents or about to the 1944 level. On all classes of surfacing the low point was reached in 1937 of 91 cents per sq. yd.; the high of \$2.26 in 1948 and had declined to \$2.00 in 1954. Structural Concrete had an average bid price of \$19.90 per cu. yd. in 1937, the peak being reached in 1952 at \$78.52 per cu. yd. and the average in 1954 had declined to \$60.39.

The composite mile (39,400 c.y. exc.; 12,200 s.y. surfacing and 250 c.y. structural concrete) stood at 100.4 in 1938, rose to 258.4 in 1952 and had fallen to 203.8 at the end of 1954.

"These figures are compiled from bid prices made by the contractors" notes this bulletin. "The index for labor and materials has risen rather than fallen during this period. This means that reduction in bid prices must have come from one or more of the following: (a) increased productivity of labor; (b) increased productivity of equipment or (c) profits of the contractor. From which of these do *your* reduced prices stem? It's time to know your cost."

- An innovation in bridge building is pictured here. The 70-foot prefabricated light-weight concrete bridge girder being loaded on a steamer for Alaska, out of Portland, Oregon. The Empire Building Material Company is the fabricator. The bridge will be erected for a highway near Seward.

Street Engineering — New Companion to Roads and Streets

During July, the Gillette Publishing Company launched STREET ENGINEERING, a new specialized publication, which you will receive without charge if you are an executive municipal employee or consultant engaged in urban street or traffic work.

This publication will deal intensively with the various aspects of street and traffic problems. ROADS AND STREETS will continue to be a diversified magazine as in the past, covering the entire highway field, both urban and rural, and giving attention to contractor problems and construction methods, as well as the engineering and administrative side of roadbuilding.

The first issue of STREET ENGINEERING, the Pilot Issue, is 200 pages in size and contains about 40 articles, whose authors number among the nation's top-ranking professional leaders in their respective fields. There will be no other issue this year. Beginning in January of 1956, STREET ENGINEERING will be published monthly.

Jack H. Gould, recently Director of Public Works of Richmond, Virginia, and well known in the municipal circles, has been appointed editor of

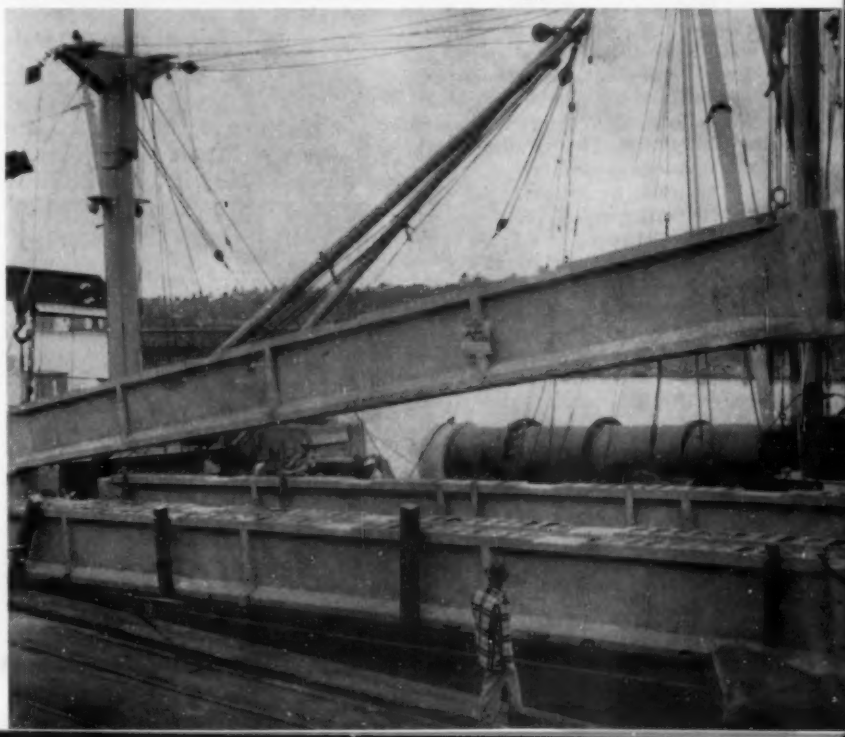


Jack H. Gould

STREET ENGINEERING. He will also serve as an associate editor of ROADS AND STREETS.

- One of the most impressive bits of data on the safety of an expressway comes from Detroit. The Street and Traffic Commission of that city reports that the accident rate on Detroit's new expressways are only 2.3 fatalities per million vehicle miles, compared with 18.5 on ordinary surface streets.

Lightweight Concrete Bridge Girders Shipped to Alaska



Barnett Discusses Interstate Design at ASCE Meeting

HIGHWAY problems were the subject of an all-day technical session at the summer meeting of the American Society of Engineers, held in St. Louis, June 14-17, 1955. Among the speakers, Joseph Barnett, Deputy Assistant Commissioner, Bureau of Public Roads in Washington, reviewed problems and progress in Interstate Highway design.

Speaking informally from a lengthy prepared paper, Mr. Barnett noted that new design standards, which would serve as a basis for reconstructing the interstate 40,000 mile network, are shortly to be balloted on within the AASHO leadership. These standards will shape the character of the nation's main highways under the greatly enlarged federal highway program contemplated.

AASHO's committee on planning and design policies met in March on the new standards, which if adopted by the AASHO will be adopted also by the Bureau of Public Roads. The Bureau's policy here as in the past will be to seek uniformity without however eliminating individual thinking and initiative.

Mr. Barnett traced the beginnings of present design thinking back to the highway planning surveys conducted by the state highway departments in the 1930's. Then came such major landmarks in highway engineering as the Highway Capacity Manual of the Highway Research Board, the AASHO's geometric design policy, followed by new data on soils and other roadbed problems and new information of traffic flow patterns, drainage and hydrology, bridge design and other basic problems.

The result is that today we know how to design soundly for present and future traffic needs as a result of the accumulation of basic knowledge.

Keynote to the new interstate design thinking is the necessity of planning for the needs far enough ahead, so that costly new highways will not in their turn quickly become congested and unsafe. The general aim is to design for traffic of twenty years hence. The emphasis also should be on adopting basic design elements that cannot easily be changed, such as general location, profile and right of way width. These elements that "tie down" the highway should be planned with growth in mind.

Mr. Barnett observed that national

defense would inevitably be a major consideration in interstate highway design. While data on maximum wheel loads and vehicle sizes of secret military equipment remain classified, design rules are to be available.

Railway grade crossings will nearly all be eliminated in time from the interstate network, the exception being crossings on certain low-traffic 2-lane sections of the system.

Contrary to some ideas spread around, the interstate network will continue to have several thousand miles of 2-lane highways in sparsely populated areas.

Construction of 2-lane highways will be based on criteria which take into consideration not only the traffic volume but also grades and passing distances. Truck climbing lanes will figure importantly in some regions.

Outer shoulder width, set at 8 ft. minimum under the new policy, is

Needles Nominated

Enoch R. Needles, senior partner of Howard, Needles, Tammen & Bergendoff, consulting engineers of New York City and Kansas City, has been nominated president of ASCE for 1956. His election is subject to ballot confirmation by Society members in September. Mr. Needles is a past-president of the Metropolitan Section of ASCE, the American Institute of Consulting Engineers, and the American Roadbuilders Association. He is currently a vice-president of the Society, of which William R. Glidden, assistant chief engineer, Virginia Department of Highways is 1955 president.



Enoch R. Needles

Photo by Fabian Bachrach

felt in some quarters to be unrealistic, since it does not provide sufficient room for a person to change a tire alongside an 8 ft. wide vehicle. Paving of shoulders will be a growing practice stimulated by research findings at the Idaho test road. There it was found that a paved shoulder added greatly to pavement durability by protecting it against surface water infiltration.

As to medians, the committee has in mind a 20 ft. minimum for rural sections and 16 ft. for urban. The importance of wide medians to reduce glare, minimize cross-median accidents, and provide better drainage and snow storage, is gaining new attention from engineers. A wide median also provides room for adding future lanes at least cost.

Access control will be perhaps the most important consideration of all in interstate highway design, listeners inferred from Barnett's talk. Access on new interstate projects may be limited possibly to two ranch entry points per mile in the west. In more populous areas more complete control of access and roadside will be necessary, as a long range economy. Mr. Barnett said that the states cannot afford further to build roads that will begin to wither in capacity from encroachment from the day they are opened. From a safety and capacity standpoint full control of access will be a necessity on much of the interstate system.

Property damage data released in Pennsylvania

Property damages in connection with right-of-way needed for new or relocated roads, cost the Pennsylvania Department of Highways \$12,922,000 during the 1953-1954 fiscal year. This figure will probably surpass \$15 million during the present fiscal year according to an announcement from the Department.

Under the Pennsylvania Constitution, the state is not required to buy land for right-of-way. It is empowered to secure perpetual easement of the property. The property owner is fully advised of his rights to file a damage claim, and told that he must speak up within six years for such claims to be valid. Over 94% of all claims are settled on a negotiated, rather than a law suit basis.

Over 17,700 claims for damages in connection with road work have been settled in the past four years, totaling \$53 million. Most of these are in urban areas. And over 11,000 of the claims were for less than \$1,000, many being for less than \$250.

Briefly Noted . . .

In this issue we report a remarkable accomplishment by the contractors and engineers in rushing the third lane paving on the Carden State Parkway in time for Summer traffic jams. 60,000 vehicles per day crowd this highway in the Summer on weekends, and a serious bottleneck has been eliminated.

However, there were serious tie-ups of traffic during the construction and an observer is forced to compare the rather lax methods of traffic handling and safety on the Carden State Parkway widening job, with the careful methods put in force on the 66-mile widening job now in progress on the New Jersey Turnpike. The ultimate goal of both organizations is to serve the public. The chief problem is to prevent accidents, and next comes the one of handling traffic as well as possible at all times during construction.

The special contract provisions on flagging and barricading and conduct of work by the turnpike contractors were reviewed in *ROADS AND STREETS* in June. It will be interesting to check back on the experiences gained during the Summer by the contractors and engineers in following these specifications. The contractors, as well as the engineers have had to do some pioneering in enforcement of safety rules.

One of the most serious aftermaths of the political shakeups that occasionally occur in state highway departments is the time lost by the new personnel in getting projects into and through the construction stage so that the public can have the benefit of better facilities.

When such a housecleaning occurs, it is usual to find that it takes at least a year for the organization to return to a normal volume of work and to keep up with the availability of funds, along with doing a quality job of plans

preparation, field engineering and project supervision.

Only a working member of a large state highway department realizes how highly specialized and departmentalized an effort it represents today. As in a big corporation, it takes years to work up a leadership team of any kind. And it can be broken down in 24 hours by political spoils replacements of key personnel.

Come to think of it, one yardstick for rating the highway department today is the promptness with which it translates available highway funds into completed projects so urgently needed. This is not easy at best because of the basic shortage of engineering talent.

Engineers who graduated 30 or 40 years ago and felt lucky to go to work for \$75 or \$100 bucks a month, should envy the 1955 class of civil engineering graduates.

We note that 170 different industrial or other companies competed for the 128 members of the graduating class at Stevens Institute of Technology this year, or at least that many companies interviewed the boys.

It is hoped that such treatment will not turn the heads of these young fellows and make them feel as though the world owes them something on a silver platter.

One of the most important documents to come off the press recently in our field is the Highway Research Board Bulletin No. 101, "Trends in Land Acquisition." This may sound like dry reading to some of you, but it represents important contributions in thinking toward one of the most vital problems facing highway administrators everywhere.

Right-of-way costs money — more money all the time, and especially large sums in urban highway planning. It also represents a ticklish point in dealing with the public. In nearly every state, new and better laws are needed to permit the acquisition of land well in advance, while it is still relatively cheap and available and with minimum trouble.

"Two die as car hits culvert." Headlines such as this with variations are appearing by the hundreds all over the country, it would seem. We wonder just how many people will die this year as a result of bridge and culvert head walls encroaching upon the roadway or shoulders. Just one of the acute phases of the highway safety problems, but one which can be clearly aided by the application of funds — now instead of years from now.

Highway building agencies are having to give more and more attention to the safe operation of their facilities. No matter how big our road program gets (and Congress will still face up to this question) traffic safety should never be allowed to become divorced from the construction and planning agencies.

A leader in this respect is the Pennsylvania Turnpike Commission. Their latest public plea, issued just before the 4th of July weekend, was bluntly worded, "The superhighway is no place for super men."

The Turnpike officials were shooting not merely at the thoughtless or careless driver but at the average human being who fails to realize that he has limits of human endurance. On long trips, the element of fatigue is recognized as a serious factor effecting road planning and traffic control.

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... for more details circle 171, page 16

Meetings Ahead

WESTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS — Annual Meeting. Jackson Lake Lodge, Wyo.; Sept. 8-10.

THIRD ARBA NATIONAL HIGHWAY CONFERENCE OF COUNTY ENGINEERS AND OFFICIALS, sponsored by the ARBA County and Local Roads Division, New Riverside Hotel, Gatlinburg, Tenn.; Sept. 12-14.

CANADIAN GOOD ROADS ASSOCIATION — Annual meeting, Banff, Alberta; Sept. 13-16.

AMERICAN PUBLIC WORKS ASSOCIATION — Annual meeting and equipment exposition, Hotel Schroeder, Milwaukee; Oct. 2-5.

14TH ANNUAL CONFERENCE ON ROADSIDE DEVELOPMENT — Ohio State University and Ohio Department of Highways, Departments of State Building, 65 South Front Street, Columbus, Ohio; October 4-7.

AMERICAN ROAD BUILDERS ASSOCIATION — 54th annual convention and Highway Materials and Supplies exhibit, Municipal Auditorium, Miami Beach; Jan. 11-14, 1956.

Chicago airport roads involve serious problems

Formidable problems of geometric design are involved in laying out new access highways to O'Hare International Airport, which is being planned as Chicago's ultimate No. 1 municipal airfield.

As shown in the accompanying sketch, the problem is to connect the field, not only with expressways leading to the center of Chicago, but also with the route of the new Tri-State toll road, which will run north and south along the western metropolitan fringe.

Eventually, according to Joseph K. Knoerle and Associates, consultants for the Illinois Toll Road Commission, a leg will be built from the Northwest Expressway leading two miles directly to the airfield. This two-mile offshoot has been dropped from the initial toll road program.

The present scheme is for traffic from downtown Chicago to proceed westward over the Congress Expressway, now under construction, turning north onto Tri-State Highway, proceeding on northward for an interval then leaving the Tri-State Highway for the airfield (see figure).



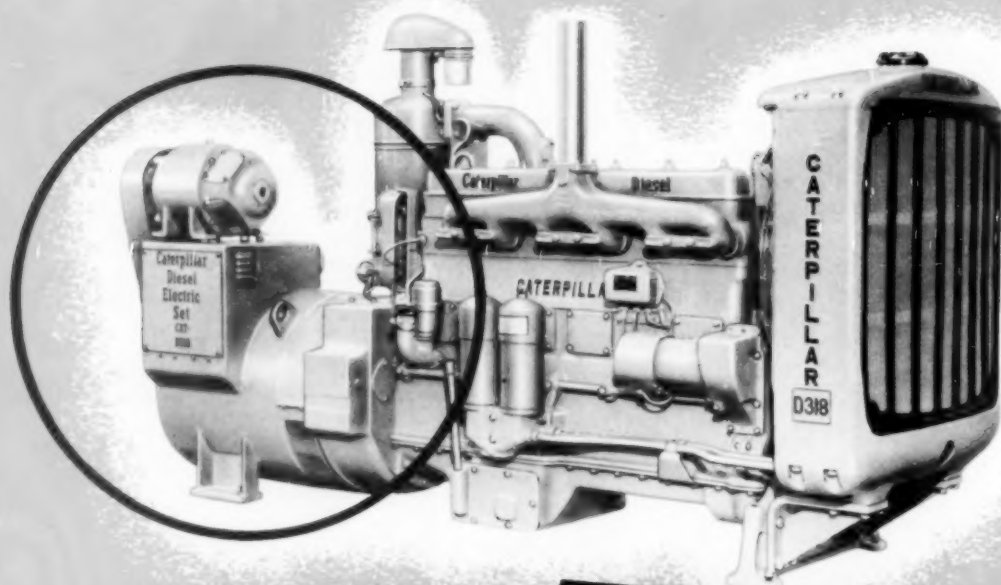
● Showing connection from Northwest Expressway, northwest of Chicago, with the Tri-State toll route and O'Hare Field.

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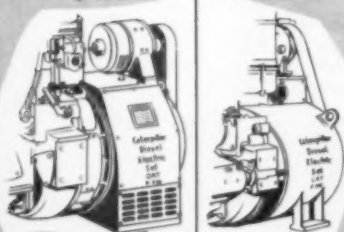
Heart of the new line of Cat Diesel Electric Sets, providing in one package the best features of self-regulated and externally-regulated generator plants—you get more for your money.

Easily paralleled with other generators now in use.

There is a big difference in size between the old and new Caterpillar Generators.

OLD

NEW



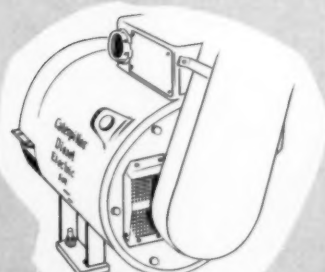
New insulation permits more compact design—exaggerated comparison in illustration below.

OLD

NEW



New design saves space. Leads can be taken from side, back or top without affecting machine width.



GENERATOR

Here is a new concept in generators — an advance that stems both from Caterpillar research and practical experience in the field of electric power.

Combining latest developments in design, materials and production, it brings to Caterpillar's new line of Diesel Electric Sets the efficiency of the externally-regulated set in a self-regulated set—you get more for your money.

These rugged power packages provide you with many new advantages. Here are a few of many features that add up to a new standard of efficient, economical performance:

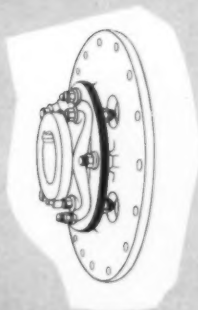
- Close regulation of voltage—no load to full load.
- Easy to start—require no operating adjustments. Anyone can run them.
- Extremely compact—big electrically, packing more power in smaller space than old style units.
- Easily paralleled with other generators now in use.
- Like all Caterpillar-built equipment—100% backed by Caterpillar.
- Sold and serviced by one reliable source—your nearby Caterpillar Dealer.

Whatever your power requirements, it will pay you to look into the new Cat Diesel Electric Sets with their advance-design generators. Get the full facts about them from your Caterpillar Dealer.

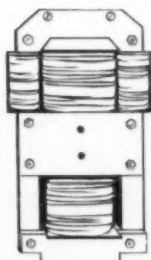
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- 4 EASY TO INSTALL.** No complicated switchgear or external voltage regulators are needed.
- 5 VERSATILE IN APPLICATION.** Easily paralleled with other generators now in use.
- 6 SMALL AND COMPACT.** Occupy less space than other generators. A reduction in frame size, close coupling, top-mounted exciter results in a shorter over-all package length.
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- 8 EASY TO MAINTAIN.** Heavy-duty, single-bearing, close-coupled construction. The single bearing is easily accessible and is lubricated from an oil reservoir that requires filling only once a year.
- 9 RUGGEDLY CONSTRUCTED.** Heavy-duty, laminated pole rotor for improved operation and increased rotor life.
- 10 DESIGNED FOR LONG LIFE.** Built to match the long life of the Caterpillar Engine powering them.

Disc-type coupling and single-bearing design save space. Single bearing is easily accessible.

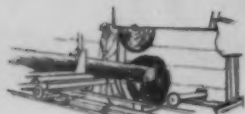


The "regulator" of the Caterpillar Generator. No moving parts—compact—reliable.

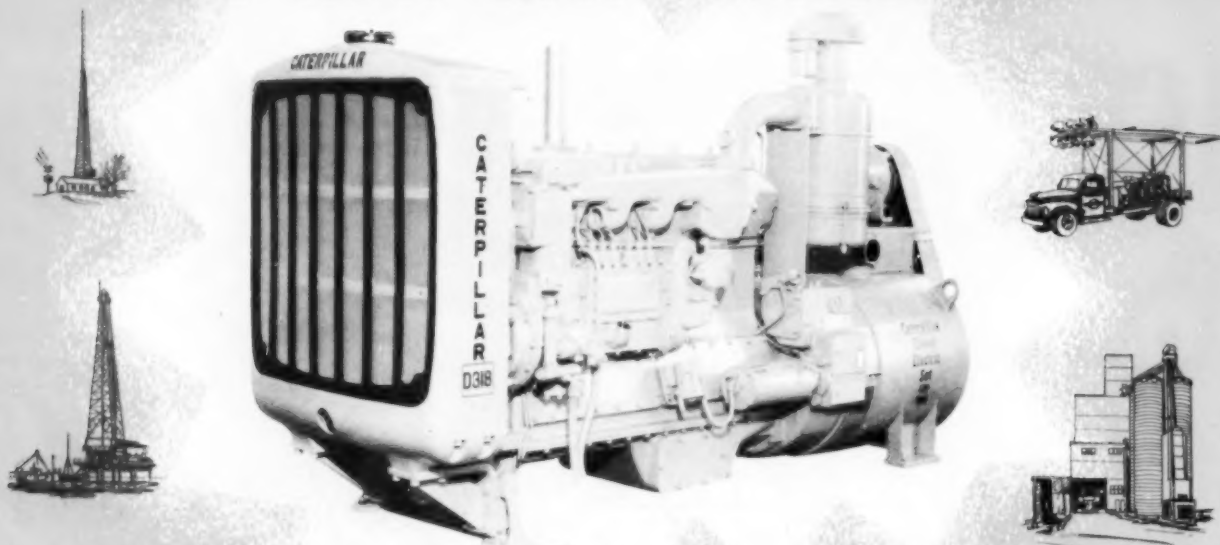


The control panel—adjustments locked at installation. No further attention required.





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In 1939, Caterpillar introduced the first Cat self-regulated Electric Set.

At the time, this was a new concept in diesel-electric power.

Like most new developments, it had to win acceptance against "old, hidebound, traditional prejudices and practices."

It won acceptance — quickly and with outstanding success!

Just look at the record: since 1939, thousands of Cat Electric Sets have delivered long, reliable, economical service in widely different applications in every corner of the world. Sets with many thousands of hours of profitable operation are not uncommon. Many with more than 100,000 hours on their meters are still in use and going strong.

No matter how old they grow, not a single one ever becomes a "parts orphan." Like every Caterpillar-built machine, genuine Cat parts will be available as long as you have a need for them.

Now Caterpillar introduces another new concept in diesel-electric power—a new and better generator, heart of the new line of Caterpillar Diesel Electric Sets.

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New design, new materials and new production techniques have made it possible for you to get more for your money in the new power packages.

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**NEW
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Roads and Streets in the News

State Highway Fund Sources Continue to Inch Up

PENNSYLVANIA: A bill enacted to increase weight limits of commonly used trucks from 45,000 to 60,000 lb. also boosted license fees for such vehicles by about \$6,700,000 a biennium.

RHODE ISLAND: A proposal authorizing issuance of bonds up to \$30,000,000 to aid in financing a four-year \$70,000,000 arterial road program was approved by Rhode Island voters in a special election June 9.

The difference between the \$30,000,000 and the total cost of the expanded road program will come from regular state appropriations and federal matching monies.

No new taxes were enacted by the recent state legislature for retirement of the bonds, which will increase the state's debt by about 70 per cent from a level of \$42,000,000.

TEXAS: A tax bill enacted included an increase in the state gasoline tax rate from 4 to 5 cents a gallon, to raise an estimated \$20,500,000 a year in additional revenue for highways.

GEORGIA: Tax bills enacted by a special legislative session included an increase in the state gasoline tax from

6 to 6½ cents a gallon; a new tax on fuel of trucks traveling through the state; a driver's license fee increase to \$1 a year; and higher registration fees for trucks and passenger cars.

Also adopted was a resolution directing the governor to give the State Highway Department all funds due it under a 1952 state constitutional amendment restricting highway-user tax receipts to road purposes.

This action is expected to give the department during the new fiscal year an amount equivalent to all gasoline and motor vehicle tax revenue collected during the period. This will total about \$68,500,000, or approximately \$13,000,000 more than the allocation previously made to the department.

In another development, the validity of a 1955 law setting up the Georgia Rural Roads Authority was upheld by Fulton County Superior Court Judge V. B. Moore in an opinion clearing the way for the authority to proceed with plans for issuance of bonds for the program.

The ruling was given in a test case filed by the governor and highway officials as a customary step to assure

WISCONSIN: A bill enacted increased the state gasoline tax from 4 to 6 cents, to produce an estimated \$20,000,000 in additional annual revenue for highways and streets.

The measure as amended at the last minute divides the increased revenue equally between the state and local governments. The governor's original proposal was to divide the funds 60 per cent state and 40 per cent localities.

Under the 50-50 split, the state will receive an estimated \$10,000,000 in addition annual revenue; counties, \$3,000,000 in additional annual revenue; counties, \$3,000,000; towns, \$3,000,000; villages and cities under 10,000 population, \$1,500,000, and cities over 10,000 population, \$2,500,000.

Also enacted was a bill appropriating \$20,000 from the state highway fund for the State Legislative Council to study highway problems during the coming biennium.

MICHIGAN: A bill enacted by the Michigan legislature boosted the state gasoline tax from 4½ to 6 cents a gallon and increased truck weight (license) taxes an average of 10 per cent.

The act's estimated \$36,000,000 in additional annual revenue will be distributed 75 per cent to the state for construction and repair of the interstate highway system and specified trunklines, and 25 per cent to cities and counties. Of the latter share, the counties will get two-thirds.

Another Michigan enactment increased the amount of money which can be pledged for limited access highway bonds from \$7,000,000 to \$12,000,000 a year.

Also enacted was a bill allowing the state to collect gasoline and diesel fuel tax on motor fuel bought outside but used in the state. Vehicles with fuel tank capacities of less than 25 gallons are exempt.

bond buyers of the validity of their investments.

The authority was created by the 1955 state legislature with power to issue up to \$100,000,000 in revenue bonds, to be paid off with a portion of funds which have been going to counties for road maintenance. The authority's initial issue, however, may go no higher than \$10,000,000 or \$15,000,000.

KANSAS: Governor Hall announced he will call a special session of the Kansas legislature immediately after the 30-day 1956 budget session next January if such action is necessary to increase the state gasoline tax to match federal highway aid.

LOUISIANA: State constitutional amendments approved by the Louisiana legislature for submission to the voters at an election next April 17 include two designed to implement a five-year highway financing program involving bond issuance.

One amendment rededicates the revenues now being received by the State Department of Highways, and authorizes the issuance of additional full faith and credit bonds to assure adequate revenues. The bonding authority is limited to \$30,000,000 in any one year and a total of \$60,000,000 over the five-year period.

A companion proposal dedicates \$12,500,000 from tidelands royalties and \$2,500,000 from tidelands bonus and rentals to payment of the bonds and the road program.

\$245 million bond issue assured for Chicago

Completion of Cook County's 60-mile expressway system, radiating out of Chicago's downtown section will be accelerated with the recent signing of a bill approving \$245 million in bonds for the program.

These bonds are expected to finance 38 miles of 6- and 8-lane urban metropolitan expressways. According to Daniel Ryan, president of the Cook County Board, and William J. Mortimer, Superintendent of Highways, the bond financing will permit completion of work in five years that would take twenty years on a pay-as-you-go basis.

The bonds which are expected to be sold at 2½ percent interest, or less, will carry the full faith and credit of the County and its taxpayers. The bonds are to be retired from gasoline tax revenue.

Unique Cellular Foundation for Bascule Bridge

By **Bruce V. Christy**

Bridge Engineer, Washington Toll Bridge Authority

and **Herbert W. Humphres**

Senior Materials Engineer, Washington Department of Highways



● Cellular pier being floated to position.

Design and construction features of partially floating piers for First Avenue South Bridge in Seattle. 278-ft.-span bascule bridge to be carried on deep silt and clay

MAJOR improvement to one of the main traffic routes in Seattle is to be realized within the next 18 months by construction of the First Avenue South Bridge and approach system across the Duwamish River, near the Boeing Aircraft works.

Several concurrent construction contracts are now under way on the initial stage of this development. These include a first bridge of four lanes and a combination of permanent and temporary approaches which will provide appropriate interchange structures for traffic in the north-south and east-west directions at First Avenue South and Michigan Street.

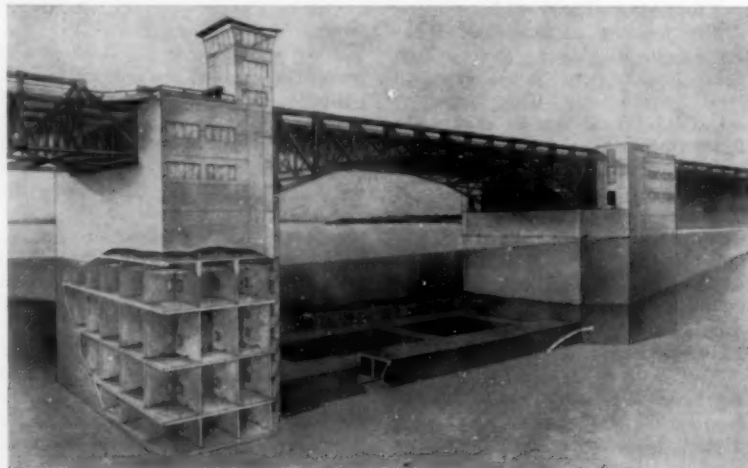
The main river crossing is by means of a double-leaf bascule bridge, 278 ft. center to center of trunnions, aligned with First Avenue South, at a skew of 52 degrees with the Duwamish River Waterway. This bridge will replace the existing 2-lane swing bridge crossing the river at a right angle to the channel. Horizontal channel clearance is 150 ft. and minimum vertical surface clearance is to be 40 ft., as compared to the 20 ft. at the present bridge. Minimum channel

depth is to be 35 feet.

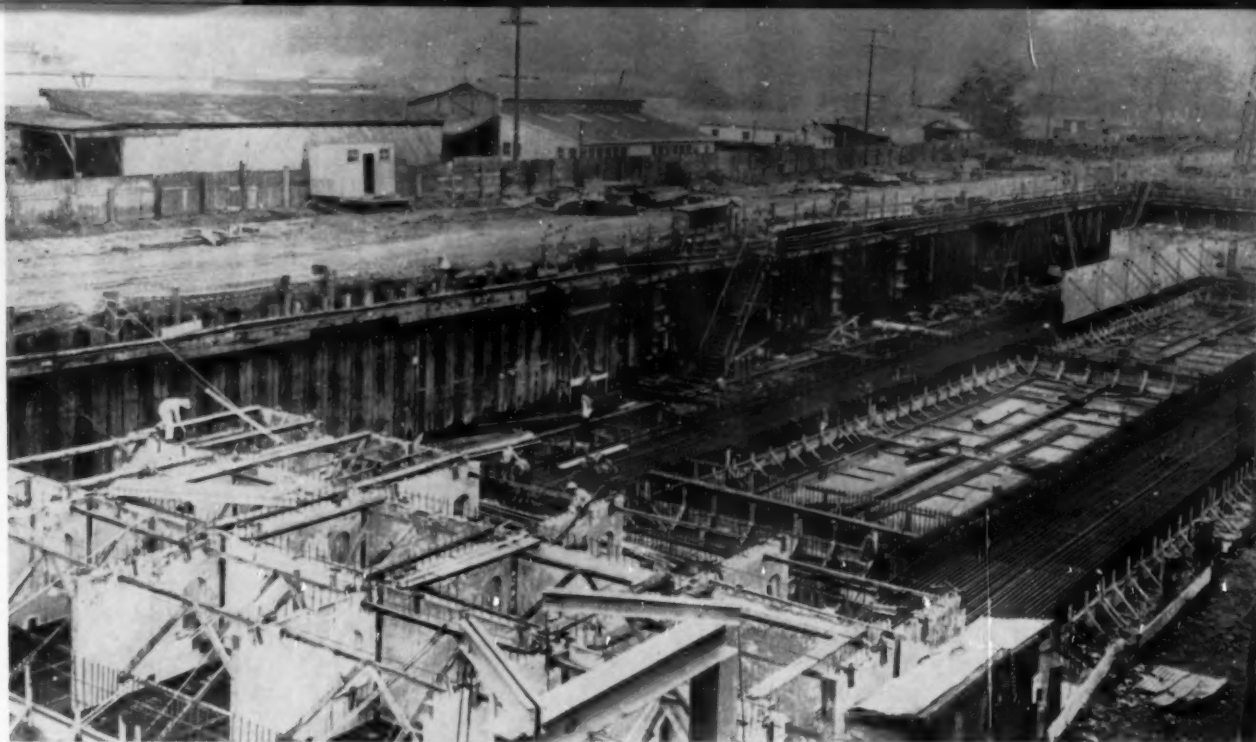
Deep Clays and Silts

In connection with the main bridge foundation design, some concern was felt at the outset regarding the use of

the usual type of bascule bridge pier. Results of test borings disclosed deep strata of soft clays and silts, which posed a difficult problem in attempting to provide satisfactory main piers founded on conventional bearing piles. While soil conditions, as revealed by the borings, were as expected above elevation -140 ft. — showing clean, medium to fine sands of medium density — the occurrence of soft clays and silts of considerable thickness below this elevation were of principal concern.



● Cut-away perspective showing design of piers and struts.



● Construction of compartmented piers in progress in contractor's dry dock.

Preliminary laboratory tests of specimens from the borings indicated possible maximum settlements of 2 ft. or more under a conventionally designed pier on pile foundation. Obviously, any arrangement of the piling, short of large caisson-type piles of great length, would be likely to result in an intolerable settlement of the main piers over a period of time. The use of such long piles to a probable depth of 250 ft. appears impractical when considering the additional load imposed by a concrete seal — required to balance the upward load due to a hydrostatic head of 70 ft.

A preliminary pier design, using conventional piles, indicated a maximum vertical load of 15,000 tons. With buoyancy considered, this would produce an approximate equivalent net pressure on the foundation of 2,300 lb. per sq. ft. Considering the obvious difficulties to be encountered in the use of such a conventional design, even with 60% of the load supported by buoyancy, the use of a fully floating foundation suggested itself.

Assuming the pier to be standing alone, it was attempted initially to provide complete flotation and sufficient lateral stability against overturning. However, this design would have required 9 ft. more draft than that used in the final design. Since this, in turn, would necessitate a much greater dredged excavation, and since it was considered somewhat better

design to provide some positive load on the foundation sand at all times, a partially floating design was adopted.

The actual pier depth was determined to provide for a longitudinal connecting strut structure between the two pier shafts — of appropriate cross section for the desired flexural strength — such that the design channel depth would be cleared by the strut. The proportions of the pier and strut assembly were adjusted to insure adequate strength of walls and slabs in the cellular construction of the entire structure and to result in a maximum base pressure of about 1,000 lb. per sq. ft.

Stability Against Overturning

A major point of design concerned the transverse and longitudinal stability of the pier against overturning. Initially, pier dimensions were chosen which would provide a substantial margin of stability, considering the pier shaft to be under complete flotation and standing by itself. In the final design, the pier shafts in connecting struts were treated as any ordinary structure on dry ground — the weight being net weight with buoyancy considerations. Several combinations of assumed live loadings on the bridge and loads due to earthquake shock were considered for the two conditions of high and low water. Maximum unit toe pressures on the "free-standing" pier shafts, due to extreme conditions of loading in the trans-

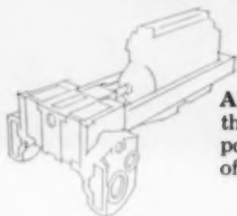
verse direction, were found to be less than 1,500 lb. per sq. ft. at extreme low water.

Because of the deep, soft strata underlying the pier base — with their relatively weak resistances to horizontal shearing forces — it is believed to be quite improbable that any seismic vibrations may be transmitted by the underlying bedrock, the source of such disturbance. Since, also, in calculating the overturning effects as described above, no account was taken of the resisting passive pressures of the backfill material, it is evident that the toe pressures thus calculated are considerably in excess of the actual pressures. Reductions in unit pressures produced in the underlying soil by use of the partially floating design — as compared with the stresses produced by conventional pile founded pier — are quite pronounced. Under these conditions, no adverse settlements are expected.

A second consideration is that of provision against vertical movement or substantial change in foundation pressure resulting from variation of tide level. This variation in hydrostatic pressure is prevented almost entirely by allowing flooding and emptying of the pier cells between low and high water levels through ports in the exterior walls at low tide level. Actually, the balance is not complete because of the reduced floor area of the chamber resulting from the presence of the intermediate cell

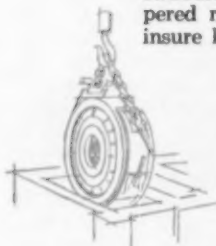
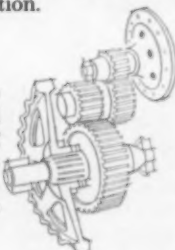
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... with all the important performance advantages of
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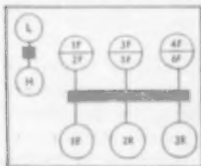
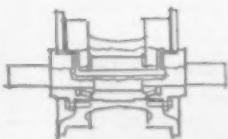
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Unit Construction lets you remove engine, master clutch, transmission, steering clutches and final drives without disturbing adjacent parts.

1,000-Hour Lubrication Intervals for roller bearing truck wheels, idlers and support rollers ... makes production time out of service time.



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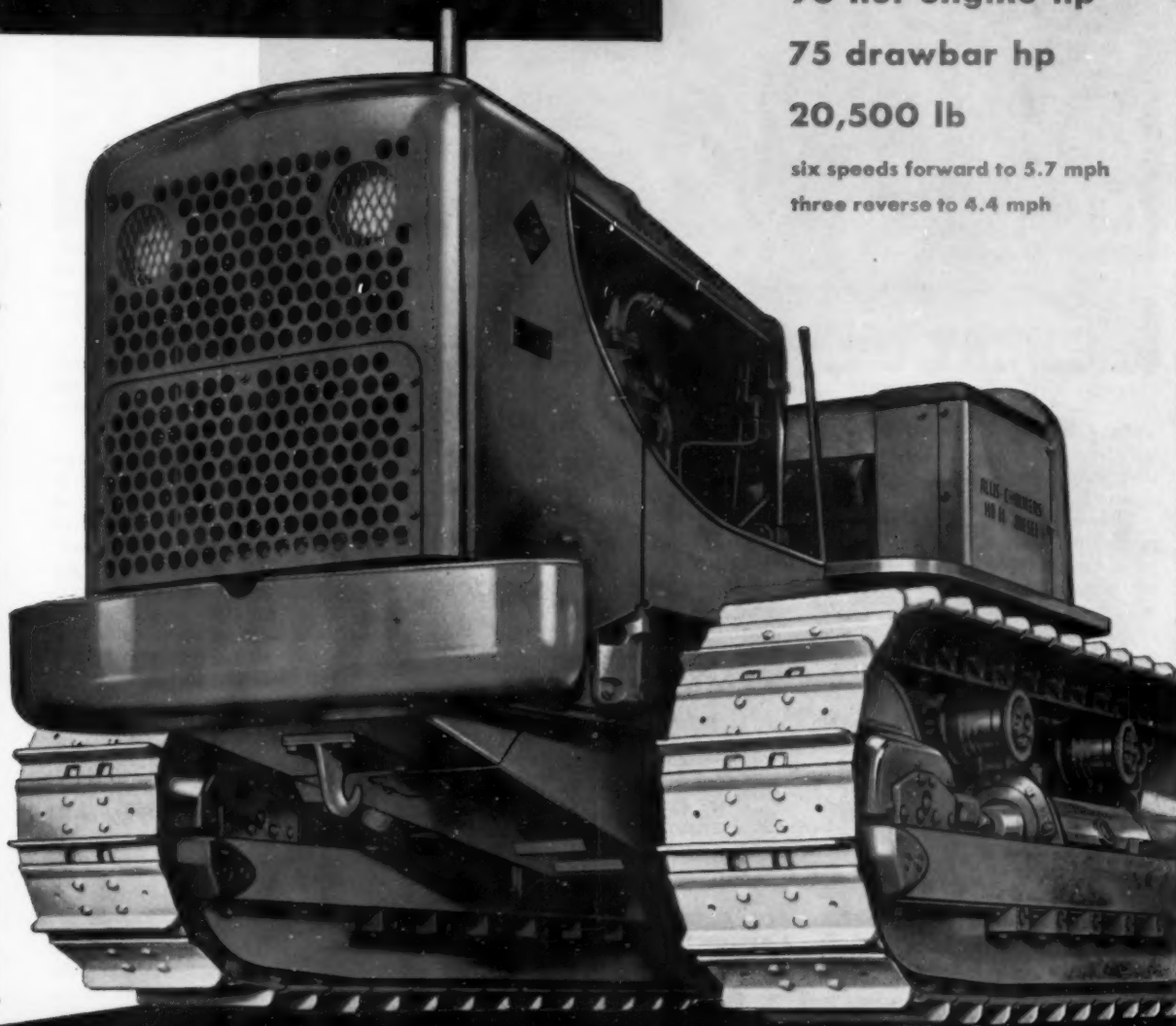
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PLUS ... new, all-weather cooling; independent radiator-core mounting; new strength and capacity in final drive gears, shafts and bearings.

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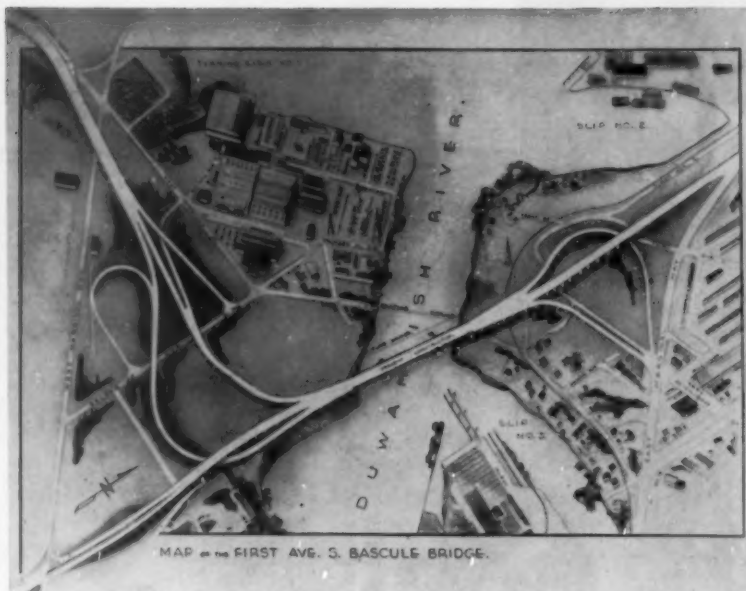
six speeds forward to 5.7 mph

three reverse to 4.4 mph

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... for more details circle 162, page 16

ROADS AND STREETS, August, 1955



● First Avenue South Bridge, first stage. It is eventually to consist of twin bridges for a dual express roadway.

walls of the pier. This relatively small imbalance results in a maximum possible fluctuation in base pressure of about 100 lb. per sq. ft.

The function of the underwater connecting struts is to prevent differential longitudinal displacement of the two pier shafts due to any cause. They will resist through flexural strength any longitudinal rotation of the pier shafts resulting from eccentrically applied live loads. Eccentric bridge superstructure dead loads at the trunnions have been permanently counterweighted by thickening of the rear walls of the pier shafts. Maximum longitudinal displacement of the pier shaft at bridge level, due to rotational effect of live load reaction at the forward shoes plus an assumed seismic force produced by an equivalent acceleration of 5% of gravity, is calculated at less than 1 in. Maximum effect of live load is calculated to be less than 100 lb. per sq. ft. of soil pressure.

Permanently impounded water in the cellular connecting strut structure and in the lower story of the pier shafts lowers the center of gravity of the system and eliminates flexure in the struts due to net upward buoyant forces.

Substructure Construction

Construction of the pier substructure is under contract with General Construction Company of Seattle at a contract price of \$1,387,655. The contractor has followed the design construction with only slight modification. The first stage consisted of in-

tegral construction of the lower story unit of the pier shafts and connecting struts in the company's grading dock on the Duwamish River about 3,000 ft. downstream from the bridge site. This unit — of 8,000 tons displacement and 12 ft. draft — was floated out of the graving dock on December 11, 1954, and tied up at an adjacent pier. Here the second stage of construction continued with the pier shafts being built up — sinking the entire assembly as the weight of walls was added. This continued to a total depth of about 25 ft., still leaving 13 ft. of channel depth over the top of the struts.

In the third stage, begun February 21 this year, the assembly was towed to the bridge site. At a predredged location just adjoining the permanent site further upward construction of the pier shafts continued. This procedure went on until the assembly had been sunk to a depth just short of the final design depth, at which time it was swung into final location.

Clamshell dredging, dragging and necessary hand work were done by divers for final grading of the bottom at the pier location. Accurate control of the fine grading was effected through sounding from the surface. Dredged material from the excavation at the pier location was deposited as fill to raise the grade of the general south approach area to uniform existing surface street grade.

Piers Ballasted

After the pier had been landed in its final position, completed bridge

loading was simulated by loading the piers by ballasting with water and other means. As the last of the upper stories of the shafts are constructed, their added weight shall be successively compensated by unloading the water ballast with a view to maintaining the simulated total bridge loading on the foundation during the process.

Backfill to design channel grade will be made with additional dredge material taken from the upstream channel adjacent to the bridge. Grout pipes have been installed in the pier shaft cell wall intersections for use in completing whatever filling may be necessary to insure full bearing of the pier assembly on the river sand. Jetting of dredged river sand under the cross struts is intended to complete the backfilling thereunder. When completely backfilled, the struts will be covered with 4 ft. of sand, thus placing the pier base 16 ft. under the finished channel grade.

The adaption of the partial floating design here is believed to be the only application to bascule bridge piers to date.

Design of the project was performed by a special temporary group in the City of Seattle Department of Engineering through an arrangement with the Washington State Department of Highways — the latter organization being in charge of construction. Supervision of foundation exploration work was provided by the Department of Highways Soils and Materials Laboratory division.

Construction industry continues with high accident rate

The construction industry ranks 36 among 40 industries reporting in the frequency rate of injuries due to accidents among workers, as reported for 1954 through the National Safety Council. The frequency rate for the industry was 17.29, up 10% over the previous year. This figure compares with 1.30 for the safest of all industries, the communications industry, and with 7.22 average of all industries. Only mining, marine, coal and lumber rank higher.

The construction industry also had a poor showing in safety with respect to the severity rate of injuries reported for 1954, ranking 35th among 40 industries with a rate of 2.29, up 11% over the previous year, compared with 0.80 average for all industries.

The accident frequency and severity rates for all industries averaged lower during 1954, compared with the previous year.



- Transporting a 90-ton transformer over the highways in Bucks County, Pa., using special walking beam with second tractor backing at the rear end.

Walking Beam Helps Carry 90-Ton Load

Rigging contractor employed special trailer assembly with back-to-back trucks to move heavy power plant equipment in Philadelphia area.

THE movement of extremely heavy loads over the public highways is engaging the attention of departments and contractors with increasing frequency these days. A case in point is the transportation recently of very heavy transformers over the highways in the Philadelphia area, in connection with the rapid postwar industrialization of the Delaware River region. Pictured here is the latest of fourteen transformers transported by Frank W. Hake, rigging contractor, during the past year. The load pictured is a 90-ton transformer. The

largest transformer haul thus far weighed 107 tons.

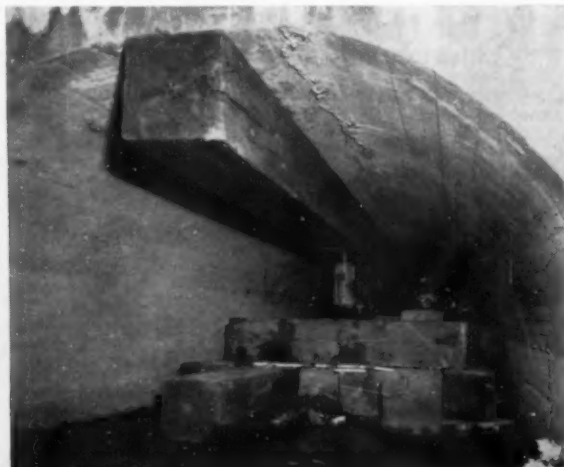
According to Glenn F. Hake, partner in the rigging firm, the special equipment was designed as a result of consultation with engineers in Pennsylvania State Department of Highways and the Philadelphia Electric Company, together with the rigging company's experts. It was determined that the existing equipment would not give sufficient weight distribution at the rear of the joined combination of vehicles considered to meet requirements of the highway department,

when used to transport loads of 60 tons or greater.

This equipment as defined, consisted of a 50-ton capacity Autocar 3-axle truck tractor with ten 1200x24 tires; a Rogers 80-ton tandem axle dolly with eight 1400x24 tires; and a Rogers 150-ton 2-axle low-bed trailer, equipped with sixteen 1200x24 tires.

After studying various methods for obtaining a greater load distribution over more axles and tires, the Hake organization conceived the idea of a walking beam over which a portion of the trailer load could be transferred to a 10-wheel tractor operating in reverse at the rear. Mr. Zengerl, a structural engineer with the Philadelphia Electric Company, designed the walking beam, using seven massive Grin-

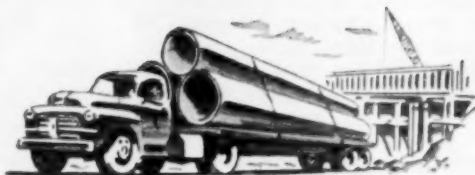
- Special shoring under a 25-ft. span concrete bridge and a concrete arch, required in connection with the transport of very heavy loads. Hydraulic jacks and heavy timbers relieved a large part of the live load.



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... for more details circle 184, page 16



Simple rear-dump construction pays off



Construction of the Tournapull Rear-Dump has been radically simplified from that of a conventional heavy-duty hauler. In place of a foundation frame and body sub-frame, Tournapull Rear-Dump hitches rear and front wheels through a horizontal yoke extending back from the kingpin and pivoted to the body itself just above and ahead of the rear wheels. Body is simpler, much stronger... has no frame and sub-frame to get out of line.

Look at the photo above... note the absence of springs, spring hangers, and tie rods. Low-pressure tires adequately absorb the shocks of rough haul-road travel and high-speed loading. Eliminated are spring maintenance, replacement time and cost of spring parts.

Front wheel drive and kingpin-type steering help simplify Tournapull construction, too. No longer must power be carried back to the rear through a drive-shaft. Bearing and lubricating problems of a long drive-shaft are eliminated. No longer is steering handled by small front

wheels subject to misalignment. There are no tie rods, no hinged steering connections to become twisted or bent.

Nor do you have the troubles of hydraulic hoists or gravity dumping with these Rear-Dumps. Dump is by an electric winch that lifts the body up on twin cables. Operation is under complete control at all times, with positive power for dump and return controlled by an electric switch on the dash. There are no oil seals, no high-pressure lines and jacks to keep tight, no freezing up in cold weather as with hydraulics. There are no shock loads as in gravity dumping. You save on regular maintenance time because there is no hoist mechanism to check... only a few places to lubricate.

Let us show you how these savings can put money in *your* pocket. For proof, we'll be glad to show you performance figures from a job like yours, or, if you wish, give you names and addresses of owners of Tournapull Rear-Dumps, so you can check for yourself. Call soon.

Tournapull Rear-Dumps Come in Sizes to Fit Your Needs

"D"	"C"	"B"	"A"
9 tons	22 tons	35 tons	50 tons
138 hp	208 hp	293 hp	420 hp

Prime-movers also power interchangeable scrapers, bottom-dumps, flat-beds, and cranes.

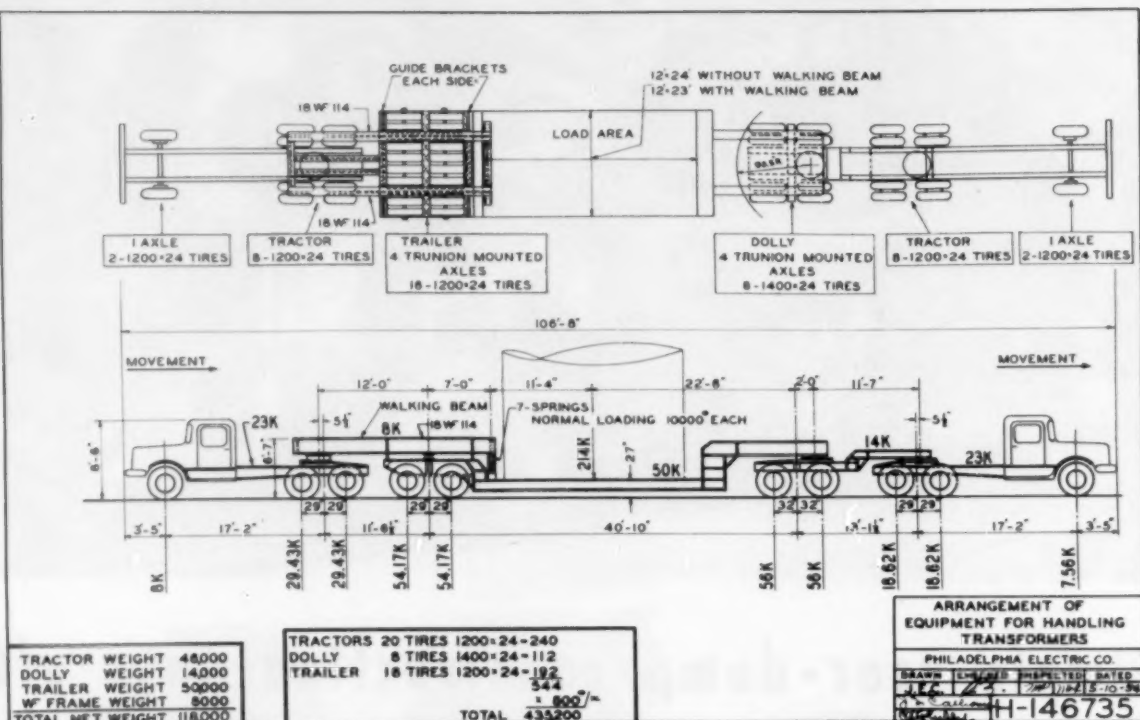
Tournapull—Trademark Reg. U.S. Pat. Off. R-774-G-b



LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



● Details of the special trailer and tractor assembly used

nel coil springs, so adjusted that a specific portion of the trailer load would be transferred to the rear tractor axles and tires, as shown on the accompanying load distribution chart.

The walking beam is so designed that the springs under normal loading are set at 10,000 lb. each. The springs have a total scale of 2,000 lb. per in. The maximum compression of the springs is 4 in. Loads can be transferred over irregular road surfaces to a maximum of 8 in. of unevenness, 4 in. each way from the midpoint. The contractor is understood to have obtained patent rights on the beam design.

All loads of 90 tons or larger carried in Bucks County around Philadelphia during the past year have been moved without damage to highways or bridges. The moves were made under the supervision of Robert Wilson, rigging supervisor of the utility company, and G. Hake, Hake Rigging, under special permit from the highway department. Pictured here are two examples of special shoring required of small bridges enroute.

The highway hauls were usually made at daybreak, in order not to interfere with normal daytime traffic. State or local police, or both, have cooperated excellently in providing escort service where necessary. Street and highway department engineers also cooperated.

Contractor safety group holds annual meeting

250 representatives of the heavy and highway construction industry in Western Pennsylvania including contractors, their superintendents, and foremen were in attendance at the Pittsburgh Pirates vs New York Giants game at Forbes Field on Friday evening, May 20, 1955.

Following a custom started four years ago, this Annual Spring Dinner on Accident Prevention held by the Constructors Association of Western

Pennsylvania was climaxed by attendance at the game, after a dinner meeting and informative talk. S. D. Webb, Supervisor of Safety of the Dravo Corporation, cited examples of costs of accidents that are not always contained in published statistics. These costs include the hidden cost to the contractors and the cost both in money and suffering to the injured workman's family.

This type of affair is one of the many activities of the Association in trying to reduce accidents in the highway and heavy construction field.

- Safety men at Pittsburgh dinner: F. B. Kissell, district safety engineer, U. S. Corps of Engineers; D. C. Jones, Booth & Flinn Co. and member of Accident Prevention Committee; Samuel L. Abernathy, safety director of Allegheny County; S. D. Webb, Dravo Corporation; William R. McQuade, chairman of committee; Earl Stephan, Western Pennsylvania Safety Council; William C. Bowden, secretary, Master Builders Association of Western Pa.; Thurman C. Tejan, executive secretary, Constructors Association of Western Pa.





In one 10-hour day, Yonkers' 10 C Tournapulls moved 861 loads (14 pay yards each, on a 2,000' one-way haul over a soft road that included a 25% adverse grade on return. That's total of 12,054 cubic yards! On average days, same haul distance, same fleet moved about 11,000 yards. Says Foreman Fred Vigue, "Tournapulls give this continually high production because of their speed, the big loads they carry, and their exceptional maneuverability."

RAIN 97 days out of 154

fails to stop rubber-tired earthmovers on Maine Turnpike

TO help move 3,000,000 yards of clay, rock, sand and gravel for the Maine Turnpike Extension near Lewiston, Yonkers Contracting Company, Yonkers, New York, brought in a rubber-tired fleet of 10 electric-control C Tournapulls and 2 Tournatractors.

Grading their 10.83-mile section of highway involved cuts up to 55 feet deep; fills up to 38 feet. Over 1,460,000 cubic yards of clay (including some extremely tough blue clay) had to be excavated. 1,440,000 yards of selected sand and gravel borrow had to be brought in. 100,000 yards of rock had to be blasted and moved away.

Under normal conditions, the \$2,120,909 contract would have been a routine, though large, dirtmoving job. But conditions were far from normal! Right from the start, work was hampered by heavy rains.

97 days of rain, 2 hurricanes

For more than 70 years, rainfall here from May to September has averaged 16 inches. But not this year! During these five months, Maine received over 30 inches of rain. Out of 154 scheduled working days, it rained on 97 days. Rarely did the dirt have a chance to dry out.

The crowning misfortunes came when hurricanes "Carol" and

"Edna" blew right through the job within 10 days of each other. "Carol" alone yielded 3 inches of rain in less than 2 hours.

What men on the job say:

In spite of the constant rains, Yonkers, working 80 to 120 hours a week, moved about 45% of the total yardage during the first five months. Everyone on the job was very happy with the way Tournapulls worked in slippery footing. One company official said, "*Tournapulls have done work no other equipment could have done.*" Exclusive power-proportioning differential kept "C's" from getting stuck by automatically transferring drive power from one wheel to another to take advantage of the best footing.

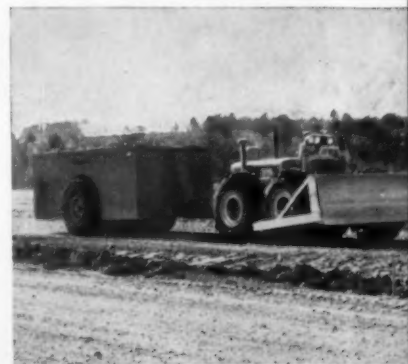
Some typical production figures

When job was visited, 5 of the 10 sideboarded Tournapulls were hauling three miles one-way to spread sand and gravel backfill around a culvert excavation. Despite slowdown to blade haul-route on return trip, each Tournapull completed a 6-mile cycle every 25 minutes. Loads averaged 14 pay yards.

At another location, 5 other "C's" were hauling 14 pay yard loads of sticky blue clay 1300' to 1500' down 6% grade to spread on the roadbed. Job records covering this operation

show each Tournapull averaged a 3000' cycle every 7½ minutes. Load time averaged 45 seconds; dump time, 20 seconds; haul and return speed averaged 8 mph.

Ask for more information



Tournatractor speed, power and ability to work over soft fill were money-saving advantages in towing of this 50-ton compactor. In its spare time, rubber-tired unit travels all over the job at speeds to 19 mph to handle small clean-up assignments. Yonkers' second Tournatractor pushes the loader . . . cleans the pit . . . pushes stuck trucks . . . builds and maintains haul roads.

Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark PT-748-H-B



This 63-mile extension to the present Maine Turnpike will connect Maine's largest city, Portland, with its capital, Augusta. Contracts

for grading, bridges, and steel, already awarded by the Turnpike Authority, total more than \$32,000,000. Nine separate grading contracts specify moving of 18,145,000 yards of dirt. The entire expressway will be paved with a 3-inch bituminous concrete surface on a 4-inch macadam base. This will be laid on a 12-inch gravel base which will, in turn, be set on 20 inches of selected sub-base.

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MARION 32-M

BIG OUTPUT



Advanced, Efficient Design Assures Long Life, Non-Stop Performance, Minimum Maintenance

- ▶ Smooth, positive control of hoist clutch provided by disc type Servo brake.
- ▶ Deck gears recessed in oil; liberal use of anti-friction bearings for easy operation and long life.
- ▶ Available with gasoline or diesel engine. Torque convertor (optionally available) increases production . . . provides smooth, precise control.
- ▶ Third drum can be added for hanging leads or handling piling.
- ▶ Independent worm type boom hoist powered up and down for spotting loads. Large multiple disc type swing clutches give smooth, cool performance.
- ▶ Compact machinery — easy access to assemblies.
- ▶ Operator's controls conveniently located for consistently high production.
- ▶ Quickly convertible in the field for handling many jobs.
- ▶ Adjustable hook type swing rollers are roller-bearing mounted for ease of operation, long life.
- ▶ Powerful, sturdy crawler frame.

• VERSATILITY • ECONOMY

The Versatile 25-Ton

32-MC

**HIGHLY MOBILE
FAST OPERATING
JOB PROVEN**

Extra Profit Features That Count!

- ▶ Rapid transit
- ▶ Modern screw jacks on outriggers (optionally available) are great time and labor savers
- ▶ Removable rear outrigger assembly (optional)
- ▶ Removable rear end counterweight (optional)
- ▶ Sturdily built, heavy duty chassis provides unusually sturdy foundation for crane and excavator service

New Literature

Get all the job-proven facts on the versatile 32-M and 32-MC. Write for your bulletins today.

MARION POWER SHOVEL COMPANY
MARION, OHIO, U. S. A.
Dept. U



For crane and rigging work



For clamshell work



For log loading

MARION

MARION POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

A Subsidiary of Merritt-Chapman & Scott Corporation

POWER SHOVELS FROM $\frac{1}{4}$ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES



Your Confidence Is Justified

Where This Flag Flies

DRAGLINES • CLAMSHELLS • LOG LOADERS
CRANES, CRAWLER & RUBBER MOUNTED • BACKHOES



... for more details circle 250, page 16

ROADS AND STREETS, August, 1955

Texas Experience with Heavy Pneumatic Rollers

How one Texas district organization came to adopt the 50-ton compactor, notes on the first results obtained, and how this unit is being put to good use today.

By W. R. Faust

District Construction Engineer
Texas Highway Department San Antonio

EARLY in 1953, a project was completed in Bexar County to add flexible base shoulders to an existing 20-ft. concrete pavement, place a 24-ft. wide bladed surface and surface the shoulders. Shortly after completing the project, heavy traffic caused settling of the shoulders along the edge of the old concrete pavement. Since asphaltic concrete was placed 24 ft. wide, the resulting offset was along the wheel track. This presented a hazard that had to be removed by building up with asphaltic concrete pavement.

Also at this time there was some discussion in Texas of rutting in wheel lanes under heavy traffic, indicating that traffic was compacting and putting additional density in flexible bases and pavement; however, this difficulty had not occurred in our area. These conditions indicated that more compaction on subgrades and bases to be subjected to heavy loads would be beneficial.

Several projects had been authorized and were programed for construction during 1954 for addition of flexible-base shoulders and widened surfacing. To prevent recurrence of conditions mentioned above on previous shoulder projects, it was decided to specify heavy pneumatic-tire rolling for the subgrade and base. It was felt that a roller of 50-ton rating would obtain the desired results with the least number of passes. Checking with contractors in our locality we found that several had used 50-ton pneumatic rollers on airfield construction

under the Corps of Engineers, and owned such rollers. Work on the airfields required earthwork and base to be compacted to a specified density, and several contractors found that with the 50-ton pneumatic rollers they achieved the specified results quicker and more economically than with other available equipment.

With the information from the contractors and literature from roller manufacturers a specification was prepared which, with minor modifications to be brought out later, is in use today.

Tried in Our District

In the March, 1954, letting we had three projects wherein heavy pneumatic rolling was specified. Two of these projects provided for the addition of flexible-base shoulders and asphaltic concrete surfacing, similar to the aforementioned project. The other was the complete reconstruction of an existing city street. To date, results obtained on the projects are favorable and it is felt that the troublesome edge settlement has been reduced by the use of heavier rollers.

On one of the projects located in Medina County, density tests were run on subgrade and flexible base.

Results of subgrade tests were inconclusive due to considerable variation in type of soils encountered. On the flexible base it was found that eight to ten passes with the heavy pneumatic roller gave 100 percent density or better under the modified AASHO test method.

With the light pneumatic roller under similar conditions, 16 to 20 passes were used to obtain the same density. On this project it was found desirable to work flexible base a little drier when using the heavy pneumatic roller. Also flexible base could be laid in 2 or 3 in. layers, with less combing out of larger stone sizes and quicker laying in of material due to fewer blade passes.

In the letting of April, 1954, we had three projects and the November, 1954, letting two projects on which the heavy pneumatic rollers were specified. On one of the jobs a large number of density tests were run on embankments, foundation course, and flexible base. These tests confirmed our previous findings on the value of large rollers and we also obtained additional valuable information.

On construction of embankments it was found difficult to stabilize the natural ground using the heavy pneumatic roller. After placing one to two layers of embankment and compacting with the heavy sheepfoot rollers, succeeding layers could be compacted with the heavy pneumatic roller. Lifts of 6 to 8 in. depth were compacted to compaction ratio density with 4 to 6 passes of the heavy pneumatic roller.

Adjacent to existing embankments, at bridge ends, and on slopes the heavy pneumatic roller could not be

It has always seemed inconsistent that we specify base depths calculated by the triaxial methods of design, and then permit visual observation and inspection of compaction obtained to suffice and, in turn, to place on these bases riding surfaces over which large multiple-axled trucks will travel at high speeds the moment the road is opened to traffic.

Excerpts from a paper given at the 29th Annual Highway Short Course, Sponsored by Texas A & M College and the Texas Highway Department.

used and these areas were compacted with the sheepsfoot roller.

Density with Fewer Passes

On the foundation course, heavy pneumatic rollers and heavy sheepsfoot rollers were used together. The desired density usually required six passes of the heavy pneumatic roller. Later trials with only heavy pneumatic roller required four passes to reach density.

The same methods were used on the flexible base, which was a very rocky material, 70-80 percent retained on the 40-mesh sieve. To avoid combing out the large size stones it was necessary to lay base in layers 2 to 3 in. thick, and here the quickest method to obtain density was by use of only the heavy pneumatic roller.

The resident engineer on this project was of the opinion that additional density was obtained in the subgrade while rolling foundation course with the heavy pneumatic roller, and also in foundation course during rolling of flexible base, since blue tops showed settlement of the subgrade and the foundation course after rolling. Base depth tests indicated that foundation course and flexible base depths specified were obtained.

Subgrades not properly compacted, or too wet will not support the heavy pneumatic roller, nor will base courses placed on such subgrades support the roller. It was also found that there was little difference in cost of compacting to a specified density between the heavy pneumatic roller and the 20-ton pneumatic roller.

Operation life of heavy equipment is longer than light equipment, yet heavy equipment costs about three times as much as light equipment. The 50-ton pneumatic roller is a large piece of equipment, and on earthwork construction requires a crawler-type tractor of Caterpillar D7 size; many contractors use D8's. The unit is difficult to maneuver in narrow, tight places and on steep slopes. Until recently, some types did not have stops on the axles and turned over on slight inclines and slopes. On base courses where surfacing is to be placed and must be finished smooth, track-laying tractors cannot be used. The latest revision of specifications requires a pneumatic-tire tractor to pull the roller for this work. This covers the highlights of our experiences with the heavy pneumatic rollers.

Utilizing Our Findings

As to how we have made use of our findings, this is best represented by a project now under construction in Atascosa County on which bids

were received late in 1954. This project consists of six miles of grading, structures, foundation course, flexible base and surfacing adjacent to the present road which will be obliterated. Earthwork was constructed to subgrade elevation using ordinary compaction methods. Under a special item "Preparation of Subgrade," the subgrade to a depth of 8 in. was scarified and recompact to a minimum of 98 percent of density determined by the Texas compaction ratio method. The bid price of 3.5 cents per square yd. included scarifying, manipulating, compacting, and shaping. Sprinkling was paid for under the item of "sprinkling."

The foundation course and flexible base were also compacted to 98 percent. The bid price of these items also included all compaction costs. Sprinkling again was paid for as a bid item.

The contractor made extensive use of the 50-ton pneumatic roller on this project to obtain the specified results. He had previous experience on airfield work, working to a specified density which expedited his work and aided his understanding of the requirements.

Our findings on previous projects were further verified on this project and indicated that specifying density results will work to the benefit of all concerned.

Weight chart for steel

By W. F. Schaphorst, M.E.

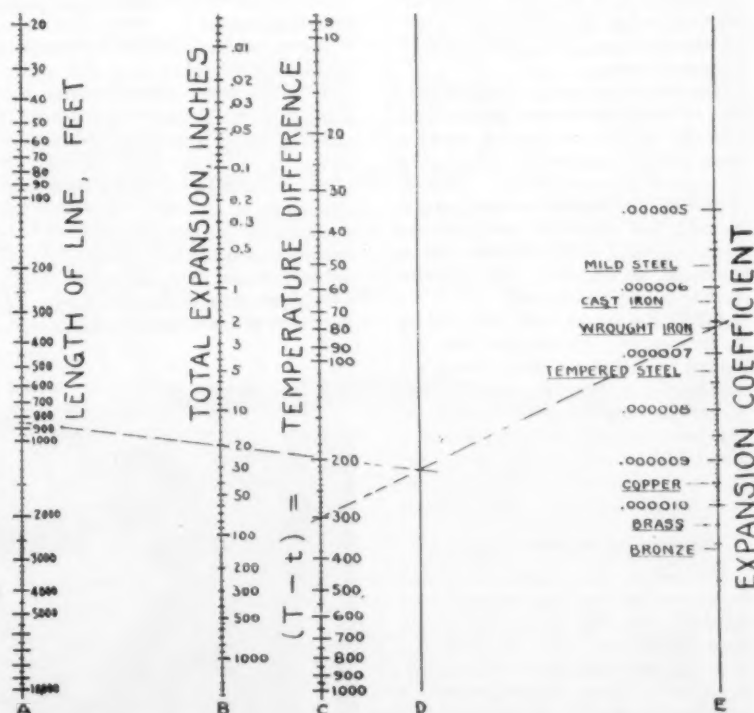
In two simple and quick operations you can determine the weight of any steel plate by using this chart. It is merely necessary to know the 3 dimensions of the plate — the length, width, and thickness.

For example, what is the weight of a steel plate $\frac{1}{4}$ in. thick, 30 ft., long, and 12 in. wide?

Run a straight line through the thickness, column A, and the length, column E, and locate the intersection with Column B. Then from that point of intersection run over to the width, column D, and the intersection with column C gives the answer.

Thus in this instance we connect the 0.25 in., column A, with the 360 in. column E because there are 360 in. in 30 ft. Then from the point of intersection in column B as shown by the drawn lines we run over to the 12 in. column D and the intersection with column C tells us that the weight is a trifle over 300 lb.

As will be noted the range of the chart is great enough to take care of nearly any steel plate. Thicknesses vary from .01 in. to 1 in. Lengths vary from 10 in. to 1000 in. And widths vary from 1 in. to 100 in. As a result the weights included run all the way from .08 lb., to 25,000 lb.



● What does the plate weigh? Here is answer.

Mechanizing Accounting Records



John Swanger, Jr.

By John H. Swanger, Jr.

Vice President, John H. Swanger, Inc.
Lancaster, Pennsylvania

TODAY'S competition makes things rather rough for the company that doesn't know — and know exactly — what its costs are. For this reason many construction firms are continuing to seek better and cheaper methods of obtaining cost figures. In the office as in the field, machines can provide the answer. The question is, what kind of mechanization is best?

Our own experience with this problem, we hope, will be helpful to other companies. After considerable experimentation and much hard work, we have developed a system of machine accounting that provides the figures we need, when we need them, at lower cost than would be possible under a manual system.

Our first attempt at improvement was to send out our cost figures periodically to an accounting service; these people accepted the information in original form and from it rendered a perfectly tabulated monthly report showing full detail for each contract item, including all subdivisions (labor, overhead, set-up, etc.), with balances to date for all cost figures.

While the report itself left nothing to be desired, the trouble with this system was that we didn't have any information *during* the month, when it was often needed most. Further, the expense of getting the report averaged about \$110 a month, and all the rest of our bookkeeping still had to be done by hand.

Accounting Machine System

We now have a system set up on a typewriter-bookkeeping machine, used right in our office, and it has proved most satisfactory. Cost of depreciation and maintenance for the equipment, which does the major part of our bookkeeping, is substantially less than we paid for report service alone.

For about four months of the year we operate with only two people on this work; we used to have three people full-time in addition to the accounting service.

Accounts Payable and Work in Progress. Figure 1 shows the manner in which Work in Progress ledgers are kept up to date as credits to Accounts Payable are entered. The voucher and remittance advice (duplicate copies) are posted at the left and the machine automatically computes and prints the gross purchases to date, discount to date and net amount due on the voucher-remittance advice. Old balances are "picked up" from the Work in Progress ledger affected, the name of the vendor is typed in, and the machine then automatically prints date, invoice number, amount and balances to date for the month, the job, and the year.

The Purchase Book or Journal is created as a by-product of this operation; columns for gross amount, discount and net accumulate as posting takes place.

All of the advantages of machine accounting are inherent in this operation. Under a pen-and-ink system, the same entry to all four of these records must be made separately, which consumes a relatively large amount of time and is open to errors; here they are made all at once. Of equal importance is the fact that to-date balances are automatically printed on all records; at any time during the month we can see at a glance what any cost has been, for any item, for the month,

job, or year to date. The machine does all the figuring work and in addition yields a line-by-line ".00 proof" (see extreme righthand column) of posting accuracy.

Other entries to the Work in Progress ledgers — for labor, overhead and so forth — are also posted by machine in a separate operation.

Cash Disbursements. When it is time to pay vendors' vouchers, the checks are written by machine (Figure 2) and the Check Register is produced automatically as a by-product of this operation. Notice that the check amount is proved before it is printed on the check, in this manner: the operator enters gross amount, discount and net in the first three columns at the left; the machine then prints ".00" if all three figures are correct; if not, it prints the amount of the error, which is immediately corrected. Name is then typed in, and the machine prints date, check number and amount. The checks are automatically numbered by the machine, and the Check Register columns add as entries are made.

Monthly Report. At the end of the month, the Monthly Report is run off by machine right from the Work in Progress ledgers. Our Monthly Report takes the form of ledger cards (see Figure 3). One of these small cards is run off for each contract item, showing a complete breakdown of all costs, for this month, for the year to date, and for the job to date. The

(Continued on page 76)

- All accounting functions are handled on one typewriter-bookkeeping machine with top speed, efficiency and accuracy.



HYDRAULICS FOR
MOBILE EQUIPMENT

VOL. 2

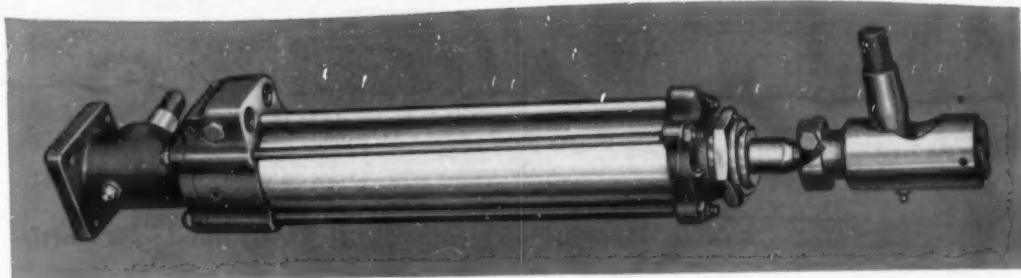
Mobile Equipment News

VICKERS INCORPORATED, DETROIT, MICHIGAN

IMPROVES
PERFORMANCE
•
CUTS COSTS

MO. 5

New! **VICKERS** HYDRAULIC POWER STEERING BOOSTER...SERIES S23



LATEST DEVELOPMENT in POWER STEERING for TRUCKS, BUSES, MATERIALS HANDLING VEHICLES, ROAD CONSTRUCTION and MINING MACHINERY

More compact . . . improved in operating characteristics . . . this new Vickers Steering Booster, Series S23 is an important new development in power steering for many vehicles. Application is much easier because it requires less space . . . and ultimate costs are substantially lower. Series S23 thus opens the way to fingertip ease of steering for a wide range of additional vehicles.

Like the preceding models, Series S23 has hydraulic lock against road shock. Bumps, chuckholes, blown front tires, obstructions, etc., cannot spin the steering wheel or jerk it out of control. This is a safety factor of great importance.

Series S23 Boosters are provided either with (Model S23R) or without (Model S23N) an integral relief valve. Model S23N is used with Vickers VT16 and VT17 pumps that have integral volume control and relief valve. When the larger volume Series V200 pump is used and a volume control is required in the circuit, the S23N is used with a separate combination valve (see Series FM2 below). Model S23R is used with the Series V200 pumps that

ASK FOR NEW BULLETIN M5106

have no integral valving, for applications where a volume control is not required.

MORE VERSATILE INSTALLATION

In Series S23 Boosters, the servo ball stud housing is symmetrical, and can be assembled in any one of four positions. This and the compactness of the Booster makes application easier . . . increases the number of applications which can be made without major engineering changes. Series S23 Boosters can be mounted interchangeably with Models S6-277 and S6-279 Boosters.

REQUIRES LESS SPACE

The new booster has been reduced in size by the redesign of the servo control valve. The tube connecting the servo valve to the rod end has been relocated and is now on the same side as the fitting connection. As a result of these changes, Series S23 requires less space . . . works in closer quarters.

7062

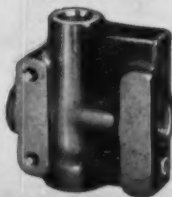
VICKERS Incorporated

Division of Sperry Rand Corporation

1432 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices: ATLANTA • CHICAGO AREA (Brookfield) • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES AREA (El Segundo) • NEW YORK AREA (Summit, N.J.) • PHILADELPHIA AREA (Media) • PITTSBURGH AREA (Mt. Lebanon) • ROCHESTER • ROCKFORD • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA • WASHINGTON • WORCESTER

VICKERS



VOLUME CONTROL and OVERLOAD RELIEF VALVE

Five sizes of Series FM2 Valves were developed primarily for hydraulic power steering on trucks, buses and materials handling equipment where the pump does not include a volume control valve. The FM2 improves steering booster performance by providing a relatively constant volume of oil regardless of engine speed variations. An integral relief valve is included.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

PURCHASE BOOK																			
DEBIT BALANCE SHEET										CREDIT BALANCE SHEET									
DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT
11-20	11.20	00		11-20	11.20	00		11-20	11.20	00		11-20	11.20	00		11-20	11.20	00	
12-01	12.01	00		12-01	12.01	00		12-01	12.01	00		12-01	12.01	00		12-01	12.01	00	
JOHN H. SWANGER, INC. GENERAL CONTRACTOR LANCASTER, PENN.										JOHN H. SWANGER, INC. GENERAL CONTRACTOR LANCASTER, PENN.									
TO COMPANY NATIONAL BANK LANCASTER, PA.										TO COMPANY NATIONAL BANK LANCASTER, PA.									
11-20 11.20 12-01 12.01 11-20 11.20 12-01 12.01										11-20 11.20 12-01 12.01 11-20 11.20 12-01 12.01									

● Figure 1. As credits to Accounts Payable are entered, distribution is made directly to the proper Work in Progress ledger; the Purchase Journal is created automatically as a by-product of this posting.

CHECK REGISTER									
DATE	DEBIT	CREDIT	NET	NAME	DATE	CHECK NO.	AMOUNT	CHECK NO.	AMOUNT
10-20	10.20	00		BELL TELEPHONE CO.	10-20	2901	10.20		
10-20	10.20	00		PENNA. DEPT. OF HIGHWAYS	10-20	2902	10.20		
10-20	10.20	00		BREWSTER SERVICE STATION	10-20	2903	10.20		
10-20	10.20	00		PROGRESS BUILDING MATERIALS CO.	10-20	2904	10.20		
10-20	10.20	00		THE WHEELBURY CO.	10-20	2905	10.20		
JOHN H. SWANGER, INC. GENERAL CONTRACTOR LANCASTER, PENN.									
PAY TO THE ORDER OF THE WHEELBURY COMPANY									
JOHN H. SWANGER, INC.									
TO COMPANY NATIONAL BANK LANCASTER, PA.									
10-20 10.20 10-20 10.20 10-20 10.20 10-20 10.20									

● Figure 2. When vouchers are to be paid, the checks are written by machine, and Check Register is made automatically. Checks are dated and numbered by the accounting machine.

Mechanizing Records

(Continued from page 72)

cards are filed by job, and within the job, by contract item. It is very easy to refer to one of them for information about a contract item, without having to handle cumbersome report.

The preparation of the report is nothing more than a copying job so far as the accounting machine operator is concerned; she already has all the up-to-date totals on the individual Work in Progress ledger cards and this is merely a condensing process.

Payroll. I feel we can state without qualification that a machine payroll method like the one we presently use is by all odds the finest system it is possible for a construction company to have. Payroll can be one of the "nastiest" jobs in the accounting end of this business, but mechanization puts it on a simplified basis.

As shown in Figure 4, the entire job of payroll writing is now accomplished in one operation. The employee's pay statement, earnings record, check, payroll and check register are done simultaneously. We also have to prepare a report for the State, showing hours and amount this week and to date for each employee (see columns at right). This, too, is obtained as an "extra" without effort.

As you can see in the illustration, to-date balances for earnings, F.I.C.A. and withholding tax are automatically computed and printed on each employee's earnings record; this factor alone saves hours of time in the preparation of W-2 and 941a reports.

(Article concluded page 102)

JOB NO. 7194 WORK IN PROGRESS SHEET NO. A

ITEM OF WORK: CLASS I EXCAVATION CODE NO. 2

DESCRIPTION: LABOR CODE NO. 1

VENOR	DATE	HOURS	RATE	TO DATE BALANCE			PAID
				MONTH	YTD	YEAR	
PAYROLL	FD 6%	156.00	156.00	21,339.16		21,339.16	
PAYROLL	FD 6%	150.00	306.00	21,489.16		21,795.16	
PAYROLL	FD 10%	190.00	496.00	21,639.16		22,091.16	
PAYROLL	FD 11%	190.00	686.00	21,829.16		22,281.16	
				FD 15%	21,709.16	606.00	21,709.16

JOB NO. 7194 WORK IN PROGRESS SHEET NO. A

ITEM OF WORK: CLASS I EXCAVATION CODE NO. 2

DESCRIPTION: OVERHEAD CODE NO. 2

VENOR	DATE	HOURS	RATE	TO DATE BALANCE			PAID
				MONTH	YTD	YEAR	
ACCOUNT -- 2	FD 15%	355.88	533.82	2,443.30		2,443.30	
				FD 15%	2,443.30	355.88	2,443.30

JOB NO. 7194 WORK IN PROGRESS SHEET NO. A

ITEM OF WORK: CLASS I EXCAVATION CODE NO. 2

DESCRIPTION: SET UP CODE NO. 2

VENOR	DATE	HOURS	RATE	TO DATE BALANCE			PAID
				MONTH	YTD	YEAR	
ACCOUNT -- 2	FD 15%	58.12	871.76	1,424.75		1,424.75	
				FD 15%	1,424.75	58.12	1,424.75

JOB NO. 7194

ITEM OF WORK: CLASS I EXCAVATION

ESTIMATE DATE: FEB. 29, 1968

THIS MONTH	YEAR-TO-DATE	DESCRIPTION	ESTIMATED COST	ACTUAL COST	JOB-TO-DATE
606.00	606.00	LABOR			21,709.16
355.88	355.88	OVERHEAD			2,443.30
58.12	58.12	SET UP			1,424.75
00	00	MATERIALS			596.29
00	00	PAID			792.70
00	00	CONTRACTOR			730.88
00	00	P. L. A. T. C.			317.88
00	00	PAID			1,074.76
254.12	254.12	MATERIALS			2,159.16
1,119.12	1,119.12	PAID			1,359.52
00	00	EQUIPMENT RENTAL			832.9
00	00	PAID			1,509.98
376.02	376.02	OVERHEAD			699.59
1,821.88	1,821.88	PAID			842.92
848.25	848.25	TRUCK DRIVERS			427.73
00	00	TRUCKS			312.50
279.75	279.75	OVERHEAD			893.72
12,092.10	12,092.10				94,338.01

JOHN H. SWANGER, INC.
LANCASTER, PA.

● Figure 3. Summary ledger cards are run off at month-end from the Work in Progress ledgers; these summary ledger cards constitute the Monthly Report.

● Figure 4. Payroll is also on a machine basis. As shown above, the pay statement, check, earnings record, payroll journal and check register are all created at the same time.

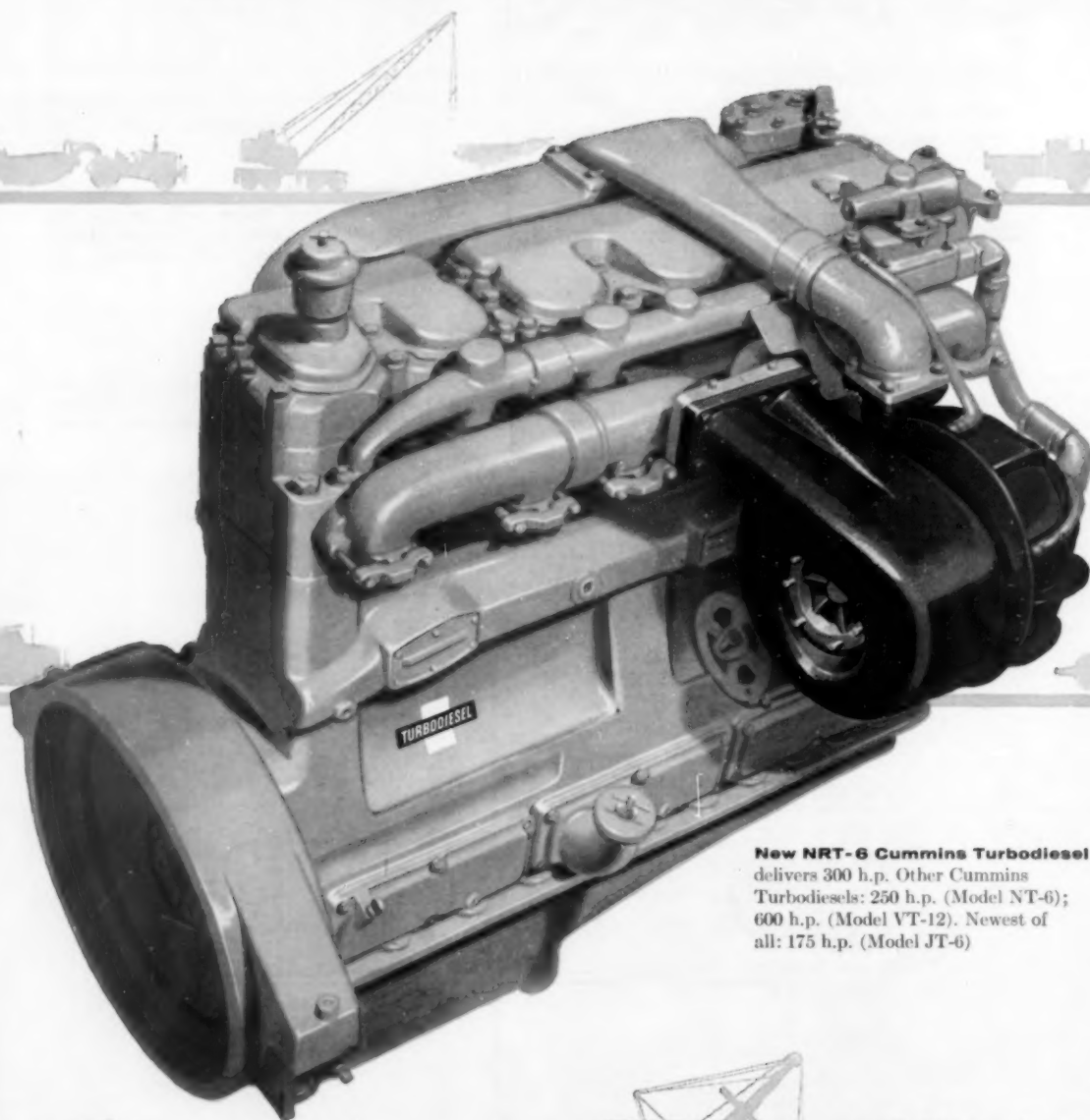
PAYROLL SUMMARY

EMPLOYEE'S EARNINGS RECORD										STATE REPORT									
NAME	DATE	TIME	RATE	AMOUNT	TAXES	DEDUCTIONS	NET PAY	TIME	RATE	AMOUNT	TAXES	DEDUCTIONS	NET PAY	TIME	RATE	AMOUNT	TAXES	DEDUCTIONS	NET PAY
ALPHY B. SWANGER	FD 15%	80	15.00				1,200.00												
ALPHY B. SWANGER	FD 15%	80	15.00				1,200.00												
ALPHY B. SWANGER	FD 15%	80	15.00				1,200.00												

JOHN H. SWANGER, INC.
LANCASTER, PA.

Now available for all kinds of construction equipment...

NEW CUMMINS



New NRT-6 Cummins Turbodiesel
delivers 300 h.p. Other Cummins
Turbodiesels: 250 h.p. (Model NT-6);
600 h.p. (Model VT-12). Newest of
all: 175 h.p. (Model JT-6)



TURBODIESELS



POWER!.....PERFORMANCE!.....PROFIT!

Here's a new power concept to make *your* construction jobs more profitable. Cummins Turbocharging brings you extra diesel horsepower without added engine weight by harnessing the energy in normally wasted exhaust gases...boosting engine efficiency.

Field tests on all kinds of construction jobs show significant savings in time, fuel and equipment. And like all Cummins Diesels, the new Turbodiesels feature the

simple to understand and service PT fuel system and easy-as-gasoline maintenance. Added time-saving economy feature for construction men: special service and parts availability on job sites is arranged by your local Cummins distributor to serve *your* needs.

No wonder more and more construction men today are standardizing on Cummins Diesels.



CUMMINS

diesels give you the big plus

MORE PROFIT

Cummins Engine Company, Inc.
Columbus, Indiana

I am interested in finding out more about the advantages of Cummins Turbodiesels. Please send me:

____ Your directory of manufacturers offering Cummins Diesels in their equipment.

____ Your booklet illustrating Turbodiesel principles.

I am interested in converting my present equipment to Turbodiesel power.

____ Please have your representative call.

Name _____

Position _____

Company _____

City _____ State _____



THE BUFFALO-SPRINGFIELD K-45 KOMPACTOR

How to select compaction equipment

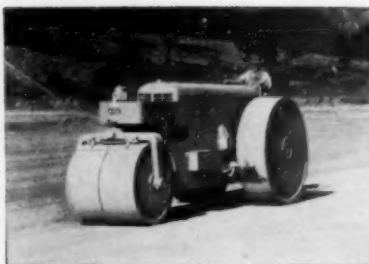
The logical question to ask yourself when you are ready to buy new compaction equipment is: "Exactly what do I need the equipment for and how will I use it?"

BASE FILL COMPACTION—This type of compaction demands equipment that will handle a wide variety of materials, give you the highest degree of compaction with the fewest passes. Buffalo-Springfield's revolutionary K-45 Kompactor is proving a real money-making answer for this type of work. It is self-propelled, relies on the "Interrupted Pressure Principle." All compaction effort is directed downward. Contractors testify they are meeting density requirements in one-fourth the time normally required with other compaction equipment.

FINE GRADE FINISHING—Buffalo-Springfield offers six 3-wheel rollers, ranging in capacity from 5 to 15 tons, to handle the large variety of materials found in fills, subgrades and unfinished bituminous pavements. The variable-weight 3-wheel roller is ruggedly built for years and years of hard, maintenance-free work.

Buffalo-Springfield's thoroughly-proved 3-axle tandem "walking beam" roller provides up to 60% greater tonnage compacted per day in superhighway construction, airport and military establishment jobs where specifications are extra strict.

ASPHALT FINISHING—Two-axle Tandem Rollers are designed especially for all surface finishing jobs. Ranging from 5 to 16 tons, Buffalo-Springfield Tandems are used for



3-WHEEL ROLLERS

heavy-duty highway and public works projects, and all types of finishing, maintenance and repair work. A wide selection of models for the biggest to the smallest jobs are designed for long-life and profitable operation.



TWO AXLE TANDEMS

SHORT ROLLING JOBS—Buffalo-Springfield's 3-5 ton portable roller is widely used for rolling driveways, sidewalks, parking and playground areas, and for patching and light fin-



3-5 TON PORTABLE TANDEM

ishing jobs. It is highly maneuverable and portable from job-to-job. Write today for full information on the type of equipment you need—or see your nearest distributor for an on-the-job demonstration.

The Standard



of Comparison

BUFFALO SPRINGFIELD

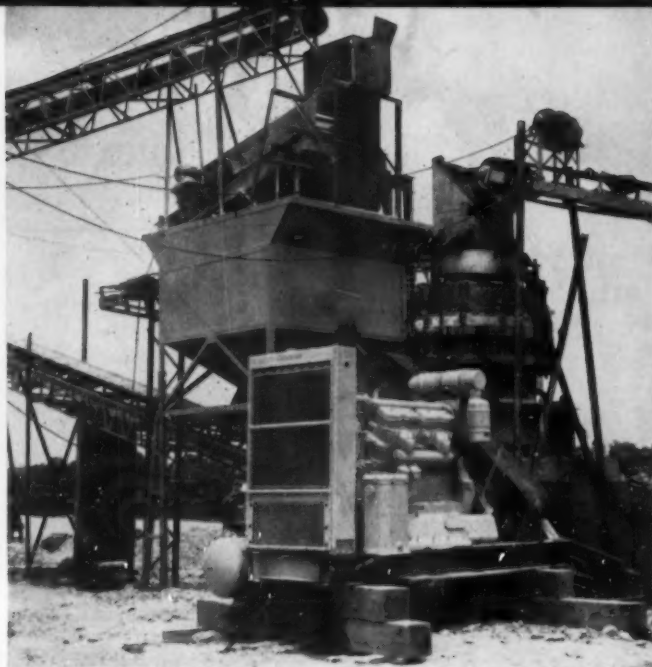
SPRINGFIELD, OHIO

... for more details circle 170, page 16

ROADS AND STREETS, August, 1955



THE BUFFALO-SPRINGFIELD KX-3 AXLE TANDEM



● Some of the details of Associated Stone Company's plant for Section A. Engine unit at right is a Caterpillar D375; crusher is a Symons 4 1/4 cone. See general plant view on next page. (Photos by ROADS AND STREETS Staff.)

Aggregate Production

FOR THE KENTUCKY TURNPIKE

How the three paving contractors and their subs are producing 3,000,000 tons of crushed stone for base course, concrete paving and shoulders on 40-mile dual highway.

FOR base course, concrete aggregate and shoulder stabilization, 3,000,000 tons of crushed limestone of various gradations will be required in constructing the 40.2-mile Kentucky Turnpike project. To produce this stone, three crushing plants have been set up along the right of way. Each is so assembled, that four or more types of stone can be produced. All of them can manufacture two gradations simultaneously.

Locating suitable quarry sites in this area was not too difficult. In fact, very good limestone rock in the right of way bankrupted one subcontractor.

This turnpike between Louisville and Elizabethtown, despite numerous

delays, is still scheduled for opening to traffic January 1, 1956. To facilitate its design and construction, it was divided into three sections. Separate bids were asked on each section for grading and drainage, structures, and paving.

Base construction and paving will be described in future reports. This summary covers only the production of base stone and concrete aggregates.

J. B. Michael & Co., Inc., Memphis, Tenn., has the paving contract for Section A, 12.3 miles in length. South-

ern Roadbuilders, Inc., Augusta, Ga., was awarded Section B, 12.6 miles. Breslin Construction Co., and R. B. Tyler Co., both of Louisville, Ky., have Section C, 15.3 miles in length. On Sections A and B, the contractors have brought in specialists in quarrying and crushing. Breslin-Tyler, long experienced in quarrying and crushing operations, have established their own plant to supply Section C.

About 1,500,000 tons of stone will be required for the base course and stabilized shoulders, 1,500,000 tons of aggregate will be required for the 40.2 miles of 48-ft. concrete pavement.

The base course (or insulation course as termed in the specifications) is to be a 6-in. compacted dense graded crushed limestone meeting the

Roads and Streets Staff Report



● Panoramic view of Associated Stone Company's plant, a closed system designed for maximum flexibility to meet various turnpike requirements.

following gradation requirements:

Screen Size	Percent Passing
1 in.	100
$\frac{3}{4}$ in.	70-100
$\frac{1}{2}$ in.	50-80
No. 4	35-65
No. 10	25-50
No. 40	15-30
No. 200	5-10

Material passing the No. 200 screen shall be less than $\frac{2}{3}$ of the fraction passing the No. 40 screen.

Concrete aggregate is to be crushed limestone, consisting of 50 percent No. 6 stone and 50 percent No. 3 stone within the following gradations:

No. 6 Stone	
Screen Size	Percent Passing
1- $\frac{1}{2}$ in.	100
1 in.	85-95



● Universal 34 x 42 jaw crusher powered by 150-hp electric motor, feeds to Smith Brothers conveyor. Associated Stone Co.

$\frac{1}{2}$ in.	25-60
$\frac{3}{4}$ in.	5-25
No. 8	0-5

No. 3 Stone	
Screen Size	Percent Passing
2 $\frac{1}{2}$ in.	100
2 in.	85-95
1 $\frac{1}{2}$ in.	35-70
1 in.	0-15

In addition to the above sizes a few thousand tons of No. 2, No. 10 and open graded subbase material will be required for specific uses on stabilized shoulders and in subsurface drainage structures.

● Twin Caterpillar D375's with Columbia 200 kw generators furnish electric motor power for Associated's plant, Section A.





● Continuation of scene on opposite page.



● Well fragmented limestone produced by Associated Stone Co. This shot comprised 3,500 lb. of 60% special gelatin and Red Cross 50% in 5 x 18 in. sticks, producing an estimated 11,000 tons with 35 ft. holes.

J. B. Michael on Contract Section A

Contract Section A covers station 75 + 30 to station 725 + 25 at the southern end. Some 400,000 tons of insulation stone and 500,000 tons of aggregate will be produced by Associated Stone Co., a combine of Clements Bros., Lenoir, N. C., and Smith Bros., Inc., Louisville, Ky. The quarry and crushing plant are located midpoint along the job.

The first quarry site selected by Associated proved unsatisfactory since the stone produced did not meet specifications. Operation of their crushing plant in a new site was just getting under way late in June. Immediate plans called for the production of insulated stone until a stockpile of 300,000 tons is obtained. The balance of the insulated course will be delivered direct from the crusher. Due to rock excavation, grading on this section is further behind schedule than on the other two sections.

The crushing plant with initial capacity of 300 to 350 tons per hour has been so laid out, however, that a second crusher can be installed to increase production if necessary. The quarry and plant will operate on a two-shift basis. A 65 ft. face is being worked, and the face is expected to increase to 75 ft.

Quarry equipment consists of one Link-Belt 2½-yd. shovel; one Northwest 1½ shovel; one Osgood crane with drop ball; one Joy Middle Weight Champ drill rig using a 6½-in. rotary bit; one Gardner-Denver 500-cfm compressor and three wagon drills; one Caterpillar D8 tractor with bulldozer, for maintaining roads and windrowing surge pile; three Euclid

15-ton rear dumps; two trucks with rock bodies, available as needed to supplement the Euclids.

The crushing plant assembly includes conveyors built by Smith Bros. All are powered by 220/440 volt motors.

The plant layout is as follows:

(1) A 30x42 Universal jaw crusher powered by 150 hp, 220/440 volt electric motor.

(2) A 36 in. x 140 ft. belt to surge pile.

(3) Under surge pile, a tunnel of 84-in. Armco multi-plate pipe. A Syntron electric feeder located at the pipe opening feeds a 36 in. x 115 ft. tunnel belt.

(4) This belt feeds stone from the surge pile to a Symons 4½ standard cone crusher powered by a Caterpillar D375 unit.

(5) A 36 in. x 130 ft. belt delivers secondary output to dividing chutes.

(6) Each chute discharges on to a 5x14 two-deck screen. Material over

¾ in. from one chute discharges to a Symons 4-ft. shorthread cone crusher powered by a Caterpillar D375. Over ¾ in. material from the other set of screens passes to a Pioneer 5424 roll crusher powered by a 220/440 volt motor.

(7) Material from these two crushers is recirculated to the main belt through a closed system passing over the screens into storage bins.

(8) Material over 2½ in. is delivered by a belt to a storage bin where it may be loaded on trucks or discharged on a belt and recirculated through the closed system. Provision has been made at this bin for installing a Syntron feeder and another crusher if additional output is required.

(9) Electric power for motors and flood lighting is supplied by two Caterpillar D375's driving Columbia 250 KVA generators (200 KW, 480 volt, 300 amp.).

(10) Material is weighed on Buffalo 20-ton Electrograph scales as it



● Surge pile beginning to build up at Associated's plant, as of late June.



● Clement Brothers plant for Contract B. Marco 140-ft. motor driven conveyor feeds surge pile from primary crusher.

is delivered to the job or stockpile using trucks furnished by the prime contractor.

Southern Roadbuilders Job on Section B

Contract Section B covers station 725 + 25 to station 1390 + 00. The aggregate plant is at station 1225 near Bardstown Junction. Under

arrangements which were not disclosed, Clements Bros. have a working arrangement with Nally Bros., a local commercial quarry operator, to work an existing quarry. Nally Bros. are under contract to furnish the No. 6 and No. 3 concrete aggregate to Southern Roadbuilders' Inc. from their existing crusher plant. Clements Bros. are under contract to furnish 400,000 tons of insulation stone and may pos-

sibly produce some No. 6 stone, as well as other miscellaneous crushed stone items.

The Clements Bros. set-up, designed to produce 300-350 tons per hour, is as follows:

Quarry equipment consists of one Northwest 2½-yd. shovel in quarry pit; one Koehring 605 2½-yd. shovel; one Lorain 2½-yd. shovel; two Gardner-Denver 500 cfm compressors; two Ingersoll-Rand Gyro-Flo 600 compressors; six Ingersoll-Rand wagon drills; five Euclid 15-ton rear dumps; and one Caterpillar D8 tractor with bulldozer. Drilling for explosive loadings is accomplished by an Ingersoll-Rand Quarrymaster drill rig with 6¼-in. bit. This piece of equipment is leased from Codell Construction Co. on a per-foot basis.

Marco conveyors in the crushing plant are powered by 220/440 volt motors.

The Clements Bros. crushing plant is as follows:

(1) An Austin-Western 42 x 13 apron feeder supplies a 32 x 40 Austin-Western jaw crusher; powered by an International Harvester UD-24 unit.

(2) A 36 in. x 140 ft. belt on steel tower carries the output to surge pile.

(3) Under the surge pile is located a tunnel of 84 in. x 120 in. Armco multiplate arch. A Syntron electric



● At Clement Brothers plant. Intermediate crushings are delivered to divided chutes. Oversize sent to two Symons 4 ft. shorthead cone crushers.



● General view of plant of Clement Brothers at Bardstown Junction. Huge stockpile in background contains 200,000 tons of dense graded insulation course.

feeder loads a 36 in. x 60 ft. belt serving a Symons 4 $\frac{1}{2}$ standard cone crusher powered by a Caterpillar D364.

(4) A 36 in. x 140 ft. belt delivers aggregate from the cone crusher to a dividing chute serving two sets of Lecco 5 x 14 double-deck screens.

(5) Material passing through the upper screen, but rejected by the lower screen, passes through two Symons 4 ft. shorthead cone crushers each powered by a Caterpillar D364 unit. Stone from the cones is returned by short conveyor belts to the main belt.

In order to obtain proper gradation for some aggregates it has been necessary to purchase stone dust from the

adjacent commercial quarry. This dust is delivered to an elevated storage bin, and when necessary to obtain the proper gradation is delivered to the main belt by belt.

All material delivered or stockpiled is weighed on 20-ton scales.

Electric power and light are purchased from a utility company.

At the end of June a stockpile of 200,000 tons of insulation course material was on hand, and the crushing plant was being re-rigged to produce other types of stone until the prime contractor is ready for the insulation course. It is planned to deliver the additional 200,000 tons direct from

the bins to the job. Operating on two 10-hour shifts, the plant can produce 6,000 tons of stone daily.

The Breslin-Tyler Project, Section C

Contract Section covers station 1930 + 00 to station 220 + 20 at the northern end. Quarry and crushing plant are at station 1625.

This plant will produce a greater quantity of stone than the others. The paving of Section C was let under two contracts, both awarded to Breslin-Tyler. Contract No. 9 provides for the paving of 12.5 miles and Contract No. 13 provides for the grading and



● Quarry operations by Clement Brothers for contract B. Note uniform character of rock strata. Lorain 2 $\frac{1}{2}$ -yd. shovel, Koehring 2 $\frac{1}{2}$ -yd. (605) shovel, Euclid rear-dumps, two Ingersoll-Rand Gyro-Flo 600 compressors, one Gardner-Denver 500 compressor, two I-R wagon drills.



● Austin-Western 34x40 jaw crusher, powered by an International Harvester UD-24 unit. Clement Brothers plant.

drainage, structures, and paving of the northern-most 2.8 miles at Louisville. This section involves the construction of numerous drainage structures, grade separations and extensive interchange facilities at Louisville.

The Breslin-Tyler plant is scheduled to produce 500,000 tons of insulation base and nearly 1,000,000 tons of concrete aggregate and coarse grade stone for adjusting existing

alignments at intersections. 208,000 tons of insulation material, 44,000 tons of No. 6, and 55,000 tons of No. 3 stone had been stockpiled by the end of June.

Quarry equipment consists of one Bucyrus-Erie 54-B 2½-yd. shovel; one Bucyrus-Erie 22-B crane with drop ball; one Joy Middle Weight C hamp drill rig, using 6¼-in. bit; one Caterpillar D6 shovel loader; one Ingersoll-Rand 105 cfm compressor and

hand drills; three Euclid 15-ton rear dumps.

The Breslin-Tyler plant is as follows:

(1) A 42 x 12 Pioneer apron feeder supplies a Pioneer 42 x 48 jaw crusher, powered by an Allis-Chalmers D844.

(2) Material from the primary crusher moves over a 36 in. x 60 ft. Atlas motor-driven belt to a Pioneer 54 x 24 roll crusher, powered by another D-844 unit.

(3) A 36 in. x 150 ft. Transall electric powered conveyor extends from this crusher to dividing chutes, which discharge over two 5 x 12 Allis-Chalmers double-decked screens.

(4) Material which fails to pass the top screen is discharged through chutes to a Williams hammermill, powered by a Caterpillar D364. Crushings from the hammermill are recirculated to the main belt by a 30 in. x 60 ft. motor-driven Atlas portable conveyor.

(5) Material failing to pass the second screen is discharged through chutes to a 54 x 24 Pioneer roll crusher, powered by an Allis-Chalmers D-844. Crushings are returned to the main belt over the same portable conveyor serving the hammermill.

(6) Electric power for belts, screens, lighting, etc., is supplied by a Caterpillar D337 diesel set.

(7) Material from the crushing

● Breslin-Tyler's crushing plant for the turnpike is a compact straight-line production assembly, with provisions for recirculating secondary crushing when required. A 42x12 apron feeder supplies a Pioneer 4248 jaw crusher.



plant is weighed on Winslow 50-ton truck scales.

Gradation is checked frequently each day by each of the contractors. Samples are also collected daily by the section engineer for each section, and gradation and abrasion tests are conducted in laboratory facilities operated jointly by the three section engineers.

At each of the quarry sites extreme care has been exercised by the operators in stripping the overburden; in some instances the upper strata of limestone were removed and wasted or where economical, used as fill material.

Stockpiles have been built up in layers on all the contract sections; no dumping over the sides is permitted. Material from the stockpile is being loaded into trucks by tractor shovels on all the jobs.

Skid-proofing program for Jersey Skyway bridge

As a result of exhaustive studies and check tests, the New Jersey state highway department has developed a two-fold plan to increase driving safety on the Pulaski Skyway approaching New York City (Route U.S. 1).

The concrete roadway will be resurfaced with a thin layer of skid-resistant material and separation of opposing lines of traffic by means of a concrete barrier curb. The safety treatment will extend 2.3 miles over the most hazardous section.

The resurfacing will consist of abrasives held in place and bonded to the old roadway. Tests had been conducted to determine on a material which will prevent skidding as well as adhere to the present concrete.

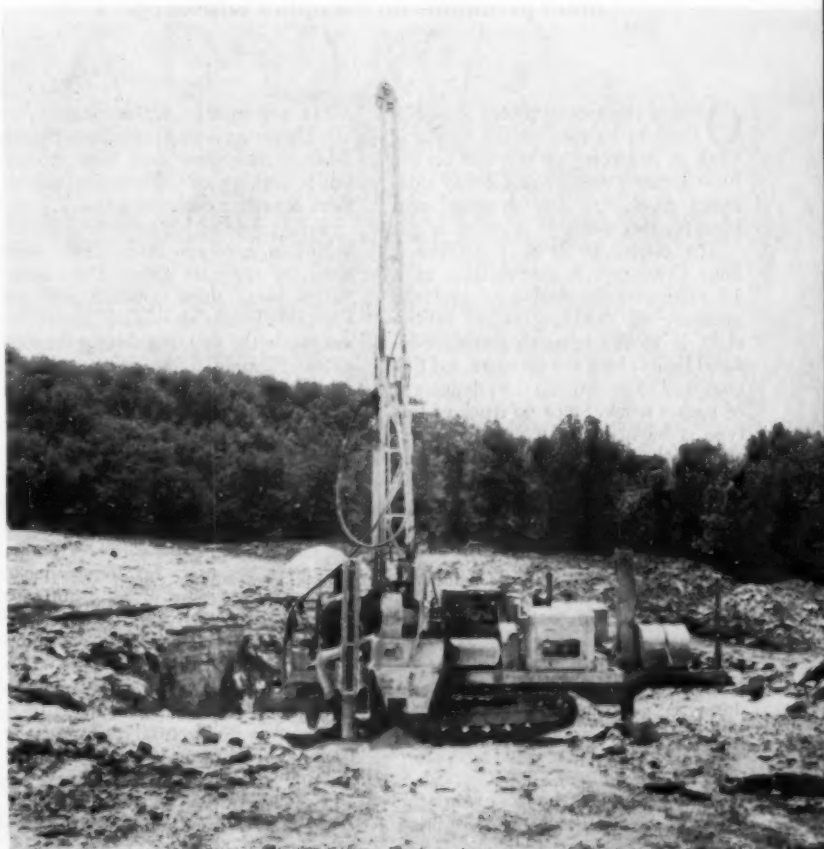
The New Jersey engineers state that skidding accidents on the Skyway result from oil drippings on the concrete roadway which has worn to a terrazzo-like surface as a result of 60,000 car-a-day traffic volumes over the past quarter century supplemented by reckless driving.

By installing the barrier curb along the center line of the roadway a divided roadway will be effected. The present distance between curbs is 48½ ft. When the 15 in. high curb is in place, two 23½ ft. one-way roadways will be available.

- At Breslin-Tyler quarry, at work for Section C stone — Joy Middle Weight Champ drill rig putting down 6" by 45' holes.



● In Breslin-Tyler quarry for Section C. Bucyrus-Erie 2½-yd. (54-B) shovel loading 15-ton Euclids. Bucyrus-Erie 22-B crane with drop ball also seen at work.





● How S. J. Groves' new special side-dump truck looks in action.

Special Two-Way Side-Dump Body

Built for S. J. Groves and Sons Co. to meet problems on Turnpike widening

ONE of the special pieces of equipment to be seen on the widening work in progress this summer on the New Jersey Turnpike is a 2-way side-dump truck specially designed and built for this work.

The contractor is S. J. Groves & Sons Company. A combination of a 15 mile over-the-road haul and the necessity of dumping either to the right or to the left in narrowly confined limits along the turnpike, led this company to investigate the advantages of such a truck. Since no truck of this type is being manufactured commercially, the contractor consulted a home-town equipment firm (Chas. Olson Equipment Company of Minneapolis) to see what could be devised.

After considerable trial and error, Olson's shop foreman, Al Nelson, and his crew developed a 2-way side dump body that worked to the contractor's satisfaction. This equipment, as finally built, includes a Heil power take-off and pump with the lever on the 3-in. pump disconnected and locked in a raised position. That lever was then connected to a 4-way valve to operate the raising cylinders.

Back position on the lever raises the dump body and the forward position lowers it. The lever then slips back

into center position automatically. Two double-acting 4-in. Heil cylinders with 34-in. stroke were used (one at each end) working off of two replaceable 2-in. diameter centered pins.

Four single-acting Johnson cylinders with 2-in. bore and 20-in. stroke were used for the side gates. Two 3-way valves were then installed, one for each side gate with two additional levers inside the cab, for closing the side gates. Flexible hoses were mounted under the body and centered so that the dump angle would be equal on each side. The larger high-pressure lines feed the cylinder and the smaller low-pressure lines return the hydraulic oil back to the system. A nine gallon oil reservoir was mounted on the truck.

The trucks used for these special bodies are standard Ford F-800's so equipped that the pump is the same as that used on an ordinary end-dump for interchange purposes. A 6-in. standard structural channel sub-frame was built onto the truck surmounted by a 4-in. standard structural channel body frame with 4-in. (7-lb.) structural channel stringers. The stringers are 34 in. wide on the outside dimension. The entire is made up of 10-gauge high-carbon steel.

The dump has safety chains on the gates, to hold them in a flat position with the box, so that the load will be dumped out well beyond the tires. There are also safety chains on the body which prevent it from tipping over when in a raised position. Safety hooks are used to prevent slippage of the gates and are automatically locked as the dump rises. The body is unlocked from the outside on the side which is to be dumped. This assures no slip-ups on the part of the driver as to dumping the load the wrong way. There is also a 3-and-2 build-up on the springs to insure against collapse and make the frame more rigid.

The dump body is 90 in. wide, 108 in. long and 34 in. high. The gates are 28 in. The box carries a 6-yd. struck load and raises at an angle of 50 degrees. The box weighs approximately 4000 lb. Groves & Sons put one of these trucks on the job in June, and several more are being built.

Indiana plans N-S 'pike

The Indiana Toll Road Commission announces the completion of arrangements to begin studies of a projected north-south turnpike route connecting the Calumet (Chicago) area with a point east of Indianapolis.

The contracts were awarded to the J. E. Greiner Co., Baltimore, Md., for civil engineering, and to Wilbur Smith and Associates, New Haven, and Parsons, Brinckerhoff, Hall and MacDonald, New York, for a traffic survey.



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because the pellets flow more easily from spreaders. Experience with Peladow in dust control and road stabilization applications has proved the additional economies offered by this improved Dow product. On roads treated with Dow calcium chloride, gravel loss has been reduced 80%, blading costs 85%.

Peladow is shipped from Dow's Ludington, Michigan, plant in bulk hopper cars, bulk tank cars, bulk trucks, as well as in 100-lb. bags. Dow calcium chloride is also available in free-flowing flake form known as Dowflake®, a 77-80% concentration. Contact Dow for more product and shipping information regarding Peladow or Dowflake.

Write THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. IN 983B.

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ROADS AND STREETS, August, 1955



Cut Downtime. . . . **on the St. Lawrence Seaway**

INITIAL excavation for the Long Sault Dam on the St. Lawrence Seaway is right on schedule. On this project, as on all the excavation projects of the St. Lawrence Seaway, Firestone Nylon Tires are eliminating big downtime losses, giving more retreads and keeping tire costs at a minimum.

You can cut your costs with Firestone Nylon Tires because they are specifically engineered for the job. The treads give more traction and they are extra tough to resist cutting. Double-thick sidewalls

give added protection against cuts and snags.

The new Firestone Safety-Tensioned Gum-Dipped* nylon cord body insures longer tire life and more retreads. The Firestone Safety-Tensioned Gum-Dipped* nylon body gives the greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

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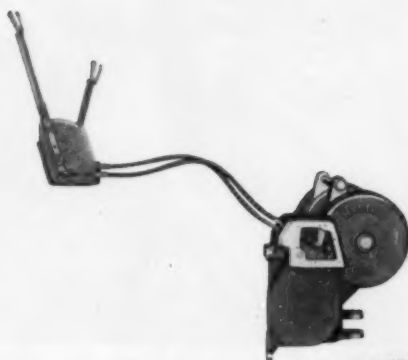
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ROADS AND STREETS, August, 1955



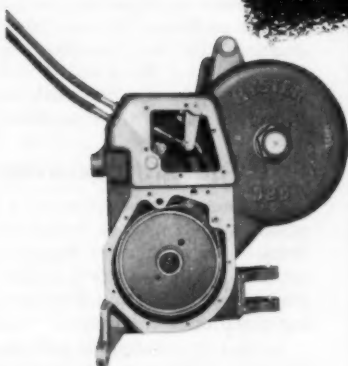
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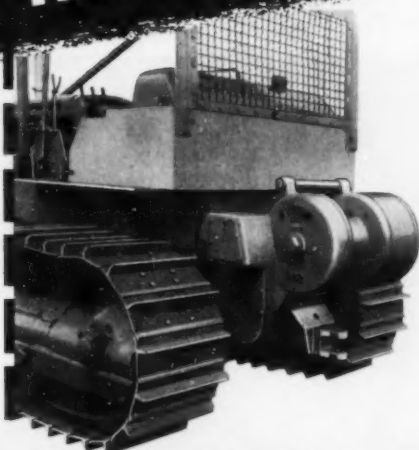
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3



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2 Smoother Shifting, Longer Gear Life with new Hyster Constant-Mesh Transmission. Gear design, with maximum tooth contact-ratio, assures positive action. All gears are case-hardened for longer life.

3 Large Capacity Brakes are designed to hold loads larger than can be moved by winch line. Cover plate can be quickly removed for easy external adjustment.

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Completely redesigned for use on the new Cat D7 and D8 Tractors, the new Hyster Model D8D

(illustrated) add Model D7D winches will also be used on older model Cat D7 and D8 Tractors.

Hyster winches increase tractor pulling power up to 100% over straight drawbar pull—extend tractor reach to the end of the winch line. A Hyster winch can reduce costs on your job.

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Tools for Caterpillar-built
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ROADS AND STREETS, August, 1955

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Curb Repair With Air-Placed Concrete

THE City of Indianapolis, Indiana, recently undertook the restoring and repairing of broken curbs throughout the city. For the work it used three basic items of equipment: an air compressor truck; a two-wheel trailer; and a Bondactor unit.

The trailer was so constructed that the dry concrete materials and a water tank could be carried on its bed, and the Bondactor could rest on a step built on the rear. Thus designed, the equipment could be easily moved along the work, and would eliminate the piling of dry materials on the street.

One man in a 4-man crew worked ahead of the mobile equipment and cleaned loose concrete and debris from the broken curbing. A second man drove the truck and fed concrete into the Bondactor hopper. A third man operated the unit and worked the controls which feed cementitious aggregate through the hose to the fourth man, who was the nozzleman.



● Mobile equipment is moved along the street, thus eliminating the need of piling materials on the pavement. Bondactor is shown on the left; nozzleman at right is applying air-placed concrete.

The application of gunned-on, air-placed concrete is reported to have been very efficient in this operation. A minimum of finishing work was required in squaring-up the curbs, since air-placed concrete forms a durable bond. The savings in time, labor and materials were outstanding in this instance.

The City of Indianapolis has owned its unit for two years and has used it many times for repairing bridges and viaduct archways. In one job which entailed restoring portions of the bridge crossing Fall Creek, the Public Works Department reported enough savings to pay for the equipment.

Fixed quantity excavation

Payment for excavation on a fixed quantity basis without final cross-sections, is the scheme for some projects expected to be awarded in the Virginia State Highway Program during the present Summer.

So that the contractor will have no misunderstanding, the plans will carry a note that the regular excavation to be paid for on plans i.e., the "fixed quantities," will be the sum of the cuts within the balance points. Excavation for outfall ditches, entrances and the like, will be measured separately and added to the fixed quantities.



● Heavy spray of air-placed concrete is gunned into the curbing.

● Before and after repairing a section of deteriorated curb.



Repaving World's Widest Bridge

THE problem of resurfacing a city street, which also happens to be the world's widest bridge (400 ft. wide), was solved by the use of corrugated steel flooring.

The structure, on Main Street in Lockport, N.Y., a part of New York State Route 31, is actually a framing of 3 hinged steel arch girders and transverse floor beams, carrying a decking over the the New York State Barge Canal. A new deck became necessary after repeated repairs failed to check the deterioration of the plank and wood block deck on the bridge.

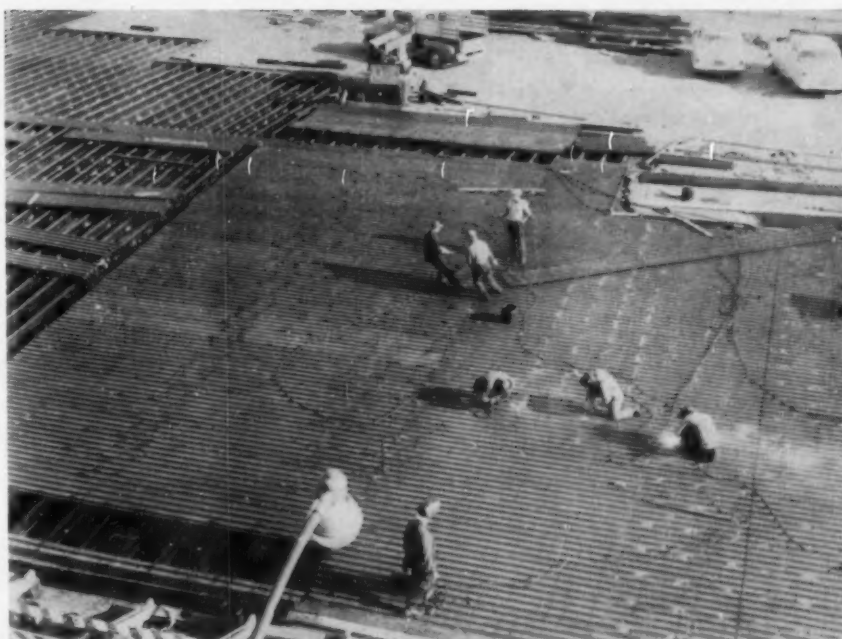
Because a limited budget and speed of erection were two important factors to be considered, the engineers decided on the use of structural plate bridge flooring surfaced with bituminous concrete on the most used portion. The heaviest traffic moved in an east-west direction, so a rather generous four-lane traffic width was designed to extend diagonally across the bridge a distance of 250 ft. for a total of 18,314 sq. ft.

In order to afford uniform bearing for the 7 ga., 2 in. deep corrugated steel flooring, new 10 in. stringers were welded to the floor beams. Oval welding holes $\frac{3}{8}$ in. x $1\frac{1}{4}$ in. were provided in the valley of every corrugation at every stringer and, for drainage, similar holes were provided in the valley of each corrugation at the quarter point between stringers. United Steel Fabricators furnished the flooring elements.

To eliminate overhead painting after installation, the plates were laid bottom up, beforehand, and two coats of black paint were applied. Welding of the plates to the stringers was accomplished by using two $\frac{3}{8}$ in. x 1 in. fillet welds at every corrugation and every stringer, and plates were joined at the edges by lapping.

Before covering with bituminous concrete, a coating of asphalt emulsion at the rate of 0.15 gal. per sq. yd. was given the entire top of the USF structural plate flooring. The first of two courses of New York State specification Item 52 MX-asphalt concrete was then placed in an amount sufficient after rolling to fill the valley corrugations completely and densely. The final course of the MX-Asphalt awaited warmer weather.

Charles R. Waters, who recently retired as New York State District



● New floor for bridge at Lockport, N.Y.

Engineer at Buffalo, directed the project, assisted by A. L. Miller, in charge of design, F. L. Fuller, supervising engineer and G. L. Tolsma, project engineer.

Parking meters yield 4 million yearly for NYC

Parking meter revenues for 1954 collected by the city of New York were estimated at \$4 million, in the annual report of that city's department of traffic.

The report which was for the year 1953 just made available, estimates 1955 meter income at \$4,500,000 or more if the collections from 5,000 additional meters planned are counted in.

Metering was initiated late in 1951 with the pilot purchase and installation of 1,500 parking meters. These were spaced to five selected areas in different boroughs of New York city, on the basis of a survey determining demand for short-time curb parking space and where such space was usurped by all-day or otherwise long time parkers.

The initial meters installed at \$78,000 cost were fixed at 10c an hour.

The effect of these installations was immediately felt. A greater turnover was accomplished in shopping districts. Double parking and cruising by drivers looking for parking space was greatly reduced, relieving traffic congestion in the areas served. As a result 13,000 additional meters were installed beginning late in 1952, followed by the purchase of 15,000 more in July, 1953. By April of 1954 some 26,550 meters had been installed.

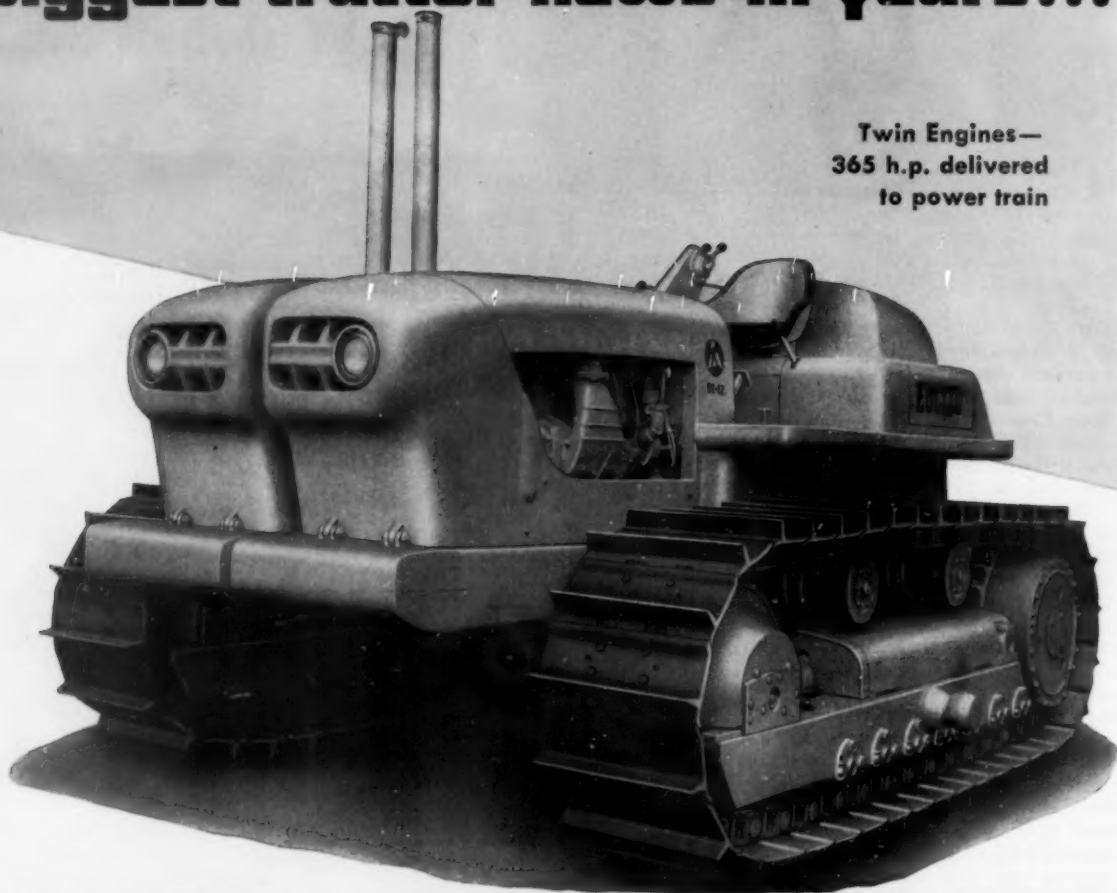
Parking meters have also proven successful from a revenue standpoint, according to this report. Meters have averaged \$200 yearly gross return, a figure expected to be reduced by the use of 2-hour meters in secondary areas. Gross revenues for 1953 totaled \$2,015,512 of which \$190,138 was spent for collection and maintenance.

Revenue bond finances parking meter program

The city of Fostoria, Ohio, recently voted to issue \$133,000 in first mortgage facility parking revenue bonds, for the purpose of acquiring, laying out, establishing and constructing off-street parking facilities.

Biggest tractor news in years...

Twin Engines—
365 h.p. delivered
to power train



Unequalled Power...Smoother Operation...

Here's a completely new concept of crawler tractor design and performance... the new TC-12 Twin-Power Euclid. It's designed and built to give you all the features you want in a tractor—more power, easy operation, greater workability and accessibility for servicing... and all of the power train components are matched, with years of application in earth moving equipment.

Powered by two diesels with separate Torquatic Drives for each track, the TC-12 has 365 h.p. available for tractive effort—a smooth steady flow of power to meet any

job requirement. There's no master clutch and no manual gear shifting... the operator simply moves a lever to select one of three speed ranges—forward and reverse—for travel speeds up to 8.3 m.p.h. Maximum drawbar pull is equal to, or greater than, the weight of the tractor and any attachments.

Each half of the tractor is separate and free to oscillate on a single transverse shaft. This gives the TC-12 maximum stability and traction on rough ground. The tractor can be easily separated into two halves for shipment when necessary.

* See Euclid's complete line at General Motors POWERAMA—the World's Fair of Power—Soldier Field Chicago, Illinois, August 31 through September 25.

Never before so much WORKABILITY!

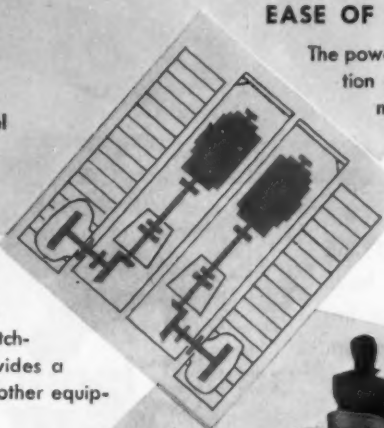
the "Euc" TC-12 Twin Crawler

INDEPENDENT TRACK DRIVES

"Hair trigger" control of steering at all times and in any speed range, forward or reverse, is a result of each track having a separate power train. Spin turns, fast and tight, can be made by reversing one track and keeping the other in forward speed. Routine steering is done easily by putting one transmission lever into neutral and using the track brake. Fast, easy steering is one of the outstanding design and performance features of the "Euc" TC-12.

TORQMATIC DRIVES

Each track is driven by a GM 6-71 diesel through a separate Allison Torqmatic converter and transmission. Shifting from one of the three speed ranges to another can be done under full power with no loss of motion . . . the tractor can be shifted into reverse while moving forward so there's no lost time for stopping and clutching. The power train of the TC-12 provides a steady flow of power that's matched to other equipment and job requirements.



TWIN ENGINES

With 365 h.p. delivered to the power train, the TC-12 has far more horsepower than any other "big" tractor . . . and the weight to use this power as tractive effort. It develops greater drawbar pull at faster travel speeds . . . a mighty important feature for work with rubber tired scrapers and other crawler applications. A top travel speed of 8.3 m.p.h. and faster speeds in the working ranges give the TC-12 a big advantage in workability.

EASE OF OPERATION

The power train of the TC-12 provides simple operation and a smooth flow of power. There is no master clutch . . . shifting from one of the three speed ranges to another is done under full power with no loss of momentum. There's no delay for stopping or clutching. Independent track drives gives this "Euc" fast, easy steering under all job conditions.

More Workability

RADIATORS AT REAR

Rear location of the cooling system maintains efficient engine operating temperatures and provides better front visibility for the operator. Hinged radiator hoods make it a simple matter to change a fan belt or to service the radiator.

ACCESSIBILITY

Unitized assemblies are all easy to get at—they can be removed or serviced without tearing down other parts. Accessibility of all major components that can't be equalled in any other crawler—keeps downtime to a minimum. All lubrication fittings and check points are located for easy servicing—fuel tanks have ample capacity for full shift operation.



SPECIFICATIONS

total h.p.—388 h.p. at rated speed
available for tractive effort—365 h.p.
speeds—3 speed ranges forward and reverse to 8.3 mph
drawbar pull (bare tractor)—forward and reverse—

54,000 lbs. low range
53,500 lbs. intermediate
53,000 lbs. high range

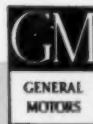
track width (standard shoe) 26"
overall width 11' 4"
height (excluding stacks) 7' 11"
ground clearance 20"

track gauge 110"
overall length 16' 2"
drawbar height 23"
operating weight (bare)
approx. 58,000 lbs.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



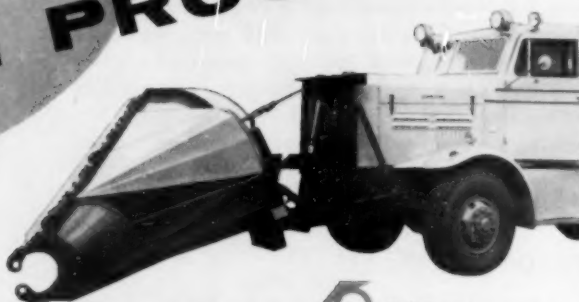
FRINK

PIONEER IN PROGRESS

Since Carl Frink made the first all-metal snow plow at Clayton, New York, 35 years ago, Frink Sno-Plows, Inc. has been foremost in the industry. Farsightedness and the courage to be the leader have always motivated every major improvement or innovation in design.

The name FRINK on a snow plow means that years of pioneering research have preceded the plow's manufacture, and only after the new model has had the severest tests under actual conditions does a plow become available for public sale.

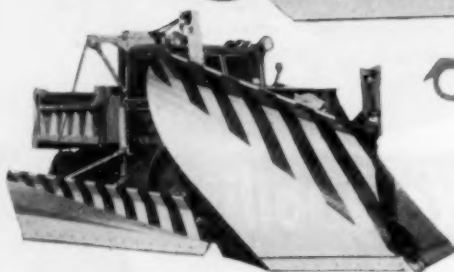
Proof of leadership is the fact that down through the years these snow plow developments have been copied by the rest of the industry, but Frink pioneering always stays ahead.



Roll-Over



One-Way

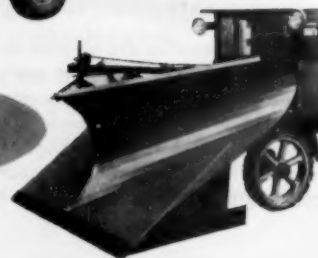


V-Type



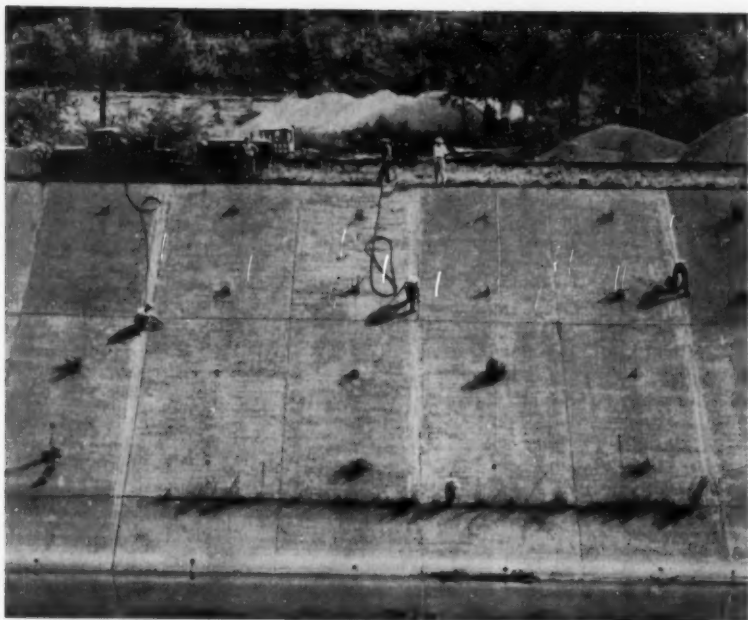
Reversible

Here is one of the first "shovel nose" V-Type plows made of steel at Frink's—even then, as now, the leader of the industry.



FRINK SNO-PLOWS, INC., CLAYTON, NEW YORK
FRINK SNO-PLOWS of CANADA, LTD., TORONTO, ONT.

... for more details circle 251, page 16
ROADS AND STREETS, August, 1955



• Equipment was positioned at the top for this unusual joint sealing.

Paving Joints Resealed on 45 Degree Channel Slope

ENGINEERS working on the river channel lining at Johnstown, Pa., recently were faced with the problem of effectively sealing concrete joints which lay at a 45° angle.

The original sealer had deteriorated to the extent that water infiltration was becoming critical through the expansion and contraction joints. The joints are $\frac{1}{4}$ to $\frac{3}{4}$ in. wide and 3 in. deep, and 50 to 84 ft. long on 25-ft. centers. The joints required a sealer with superior adhesive qualities that would not sag or flow during application or in high temperatures. Presstite

No. 77 cold-applied sealing compound was selected.

The sealing job began by routing out the old sealer and thoroughly cleaning the joints with an air hose. Then this rubber-base ready-mixed sealer was pumped directly from its shipping drums into the joints and through a material hose equipped with a nozzle. A special trowelling device attached to the nozzle made neat, smoothly-sealed joints. A compact truck unit towing all necessary equipment moved along the top of the channel lining, thus affecting ever speedier application.

Engineers for the job were U. S. Army Engineers, Operations Division, in charge of flood projects, Pittsburgh, Pennsylvania. Contractor was Robel Construction Co., Johnstown.¹

Traffic and business booms on thruway

The New York State Thruway ended its first year of toll operation with a healthy and continuing rise in revenues and an excellent safety record, according to chairman B. D. Tallamy. Some 8,700,000 vehicle trips were traveled on the progressively length-

ened cross-state expressway during the year following opening of the first 115-mile stretch.

Total travel for the first year was 522,000,000 miles, with regular toll revenue totaling \$7,050,000 (over \$4,000,000 since January 1).

The Thruway now is open for 396 miles, from Buffalo to Suffern, just north of the New Jersey border, and will be opened into the New York City area by October.

One of the most important aspects of the Thruway's first year of operation has been an acceleration of the growth of industry and other enterprises along the route, Mr. Tallamy pointed out. There is substantial evidence that the Thruway has been a major factor in the development of more than \$150,000,000 worth of new and expanded factories, truck terminals, warehouses and similar enterprises. These are estimated to employ about 30,000 persons with an annual payroll in excess of \$100,000,000.

In its first year of operation, the Thruway handled 800,000 commercial vehicles, paying an estimated \$2,200,000 in tolls.

Low bidder can withdraw from further bidding

Some months ago a suggestion was made to the Virginia Department of Highways that they permit bids to be withdrawn at a letting when the contractor had been read low on a project or projects and did not wish to be considered further. The Commissioner has approved this procedure on a two-year trial basis, according to a bulletin from the Virginia Road Builders Association to its member contractors.

Roughly, the mechanics will be that the contractor will signify his probable intent to withdraw bids prior to the opening. A list of the order of opening bids will be posted in the auditorium before any bids are opened and the contractor wishing to exercise his option to withdraw a bid may do so just prior to the opening of bids on that particular project. On projects where a contractor has indicated that he may desire to withdraw bid, the department will indicate that the low bid as read is within the tolerance established above their estimate and is awardable at the figure read out. Other minor details will be stated in the advertisement for bids. This will not apply on plant mix and surface treatment schedules.

The Association bulletin expressed the hope that "this will enable our contractor members to bid and, at the same time, to keep them from overloading at one letting."



• Looking down slope. Note special trowel device attached to nozzle.

Loss in Paver Output Traced to Batchmeter Setting

From Special Committee on Highway Equipment, Highway Research Board; Committee Report No. 29, 1955

LOSS in potential output of 34-E dual drum pavers reaches 12.5 batches per hour in some cases due largely to excessive discharge and transfer time allowances in the batchmeter setting.

So states a report on field research, released by the Highway Research Board as Circular 269.

This loss is separate from those losses caused by such job delays as paver moves, batch truck and bucket dumping delays, etc. Data relating to this matter are part of the information obtained from paver studies made over the past 5 years by the Production Cost Unit of the Bureau of Public Roads. Over 41,000 batches were timed on 29 different pavers working on 24 highway jobs.

Ability to mix two batches simultaneously is a feature of dual drum pavers that contributes to their high productive rate. Simultaneous mixing prevails except during those intervals in the batchmeter (or paver) cycle which allow for the discharge and transfer of batches (the skip is raised during the transfer). The longer these intervals are, the longer the cycle becomes for any given mixing time. It follows, therefore, that the greatest potential production (shortest cycle) will result when the batchmeter setting provides the minimum interval needed for discharge and transfer.

The average observed time allowed by the batchmeter settings for discharge and transfer was 23.6 seconds for the 29 pavers. It was 17.7 seconds for the five pavers (Group A pavers) having the shortest time interval, and 32.0 seconds for the five pavers (Group B pavers) having the longest time interval. For a 60-second mixing time, the hourly potential production rates* were 86.1 batches for Group A pavers and 73.6 batches for Group B pavers, a difference of 12.5 batches. Hence, for each one

second increase in the batchmeter setting for discharge and transfer, the Group B pavers suffered a potential loss of 0.87 batches per hour.

Some of the longer discharge and transfer intervals can be attributed to worn blades and chutes. One of the principal causes observed, however, is simply that of insufficient attention given to adjustments of batch meters. A properly adjusted batchmeter is not a cure-all for lagging production. Nevertheless it contributes to increased output when other elements of the organization are functioning at a high rate.

The studies also provided data on frequency distribution of actual mixing time. Actual mixing time includes those job delays during which mixing continued. It was found that 40% of the batches were mixed less than the required time by 6 seconds or more, 28% were mixed within 5 seconds (plus or minus) of the required time, and 32% were mixed 6 seconds or more over the required time. For all batches combined, the actual mixing time averaged one second greater than the required mixing time.

New York Thruway has safety record

The New York State Thruway Authority in its fifth annual report, reveals the following:

- A fatality rate of 2.44 per 100 million vehicle-miles for traffic which totaled 205,138,000 miles of passenger and commercial travel during 1954. This compares with a rate of 6.1 for all New York state highways during 1953, latest available statistic.

- The injury rate on the turnpike for the year was 40.46 per 100 million vehicle-miles, compared with 305 for state, streets and highways during 1953.

- Four proposed additional expressways are under preliminary study. Construction has made a good start on the New England, Erie and Niagara sections of the Thruway tying in with the 427 mile Buffalo to New York City main line, which is largely completed.

- The main line progressively completed from Buffalo down to Harri-man just north of New York, earned \$3,185,400 in tolls, permits and concession income.

- Emergency roadside service was given to 10,047 vehicle operators during the year on the thruway. Of these, 3,416 ran out of gas, 1,701 had tire trouble.

Military Bridge Unit Has Possible Contractor Use



● A quick way to get heavy equipment across a gully — a new portable wheel mounted bridge unit developed by the Corps of Engineers.

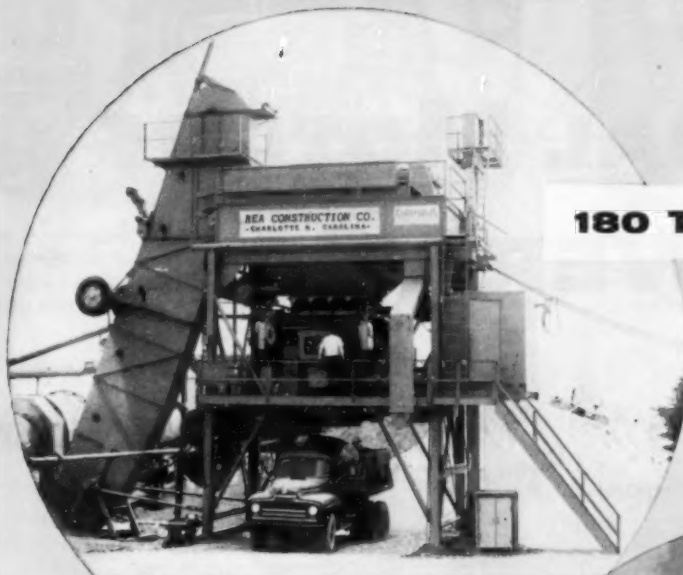
Pictured here being demonstrated in the presence of a reviewing stand full of visiting equipment representatives, is a portable assault wheeled bridge developed by the Corps of Engineers' Research and Development Laboratories at Fort Belvoir.

Along with other such units, born of military necessity, this bridge would seem to have an appeal to contractors, since the operations of roadbuilders and heavy construction contractors is often of a "forward area" nature.

*The following assumptions are involved in computing hourly potential production rates: (1) job delays are excluded, (2) mixing time includes transfer time and discharge lag, but does not include charging lag, (3) discharge lag is 1.1 seconds from opening of discharge chute until concrete appears in the chute, and (4) charging lag is 7.0 seconds from the time the batchmeter is set until all solid materials are in the drum.

Now you can **BID LOW** PROFITABLY
on any size bituminous mixing job

with one of these
high capacity,
low maintenance
Cedarapids Plants



180 TONS PER HOUR

Here's the new Model G60 batch-type plant that helps outfits like Rea Construction Co., of Charlotte, North Carolina, go after the big-money contracts. Rea's all-automatic G60 is producing at a steady 180 ton per hour clip...taking up to 7500-lb. batches, the G60 discharges a 3-ton batch every minute to meet the most exacting specifications!

120 TONS PER HOUR

The new Model G40 batch-type plant is just like the big G60 except for size and capacity. It has the same advantages of accurate batching and uniform output, the same easy portability and quick set-up, the same quality-construction throughout the plant. It's designed for jobs requiring around 120 tons per hour average production, and takes up to 5000-lb. batches.



45 TONS PER HOUR



Model H15 is a brand new Cedarapids batch-type plant designed for medium sized bituminous paving jobs, where capacities from 35 to 45 tons per hour are required. The H15 is a stack-up, tower type plant, extremely easy to erect, as each section is a self-contained unit. Manually operated, or equipped with optional electric timing and locking device, this plant is a proved money-maker rated to handle up to 2000-lb. batches.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

A Show you'll never forget!

GENERAL MOTORS POWERAMA

Gala Celebration of the 100 Millionth GM Diesel

LAKE SHORE SOUTH, CHICAGO—AUG. 31ST THROUGH SEPT. 25TH



GM Powerama presents—"roads a-building" exhibit of GM Diesel-powered equipment for both concrete and asphalt highway construction—dump trucks, concrete paver, rock crusher, graders, rollers and scrapers.

MAKE your plans now! The General Motors Powerama will be a national event too important, too spectacular to miss.

On 20 acres of grounds, a World's Fair of Power will unfold wonders galore. Fascinating exhibits—thrilling demonstrations—a colorful stage show—everything to make your visit interesting, educational and well worth the trip.

Come and bring the family. *Admission free!*

Plus many other interesting exhibits you won't want to miss—

ALLISON TURBO-JET and TURBO-PROP engines that power America's finest, fastest fighters and transports.

CLEVELAND DIESEL engines powering a submarine you can go aboard and inspect.

ELECTRO-MOTIVE's advanced lightweight 100-mile-an-hour

train with its amazing new air-suspension springing.

EUCLID's full line of 10- to 50-ton Diesel trucks and 7- to 18-yd. scrapers.

FABRICAST's exhibit of modern casting methods.

GMC Diesel trucks and coaches, ScenicRaiser and spectacular new "L'Universelle."

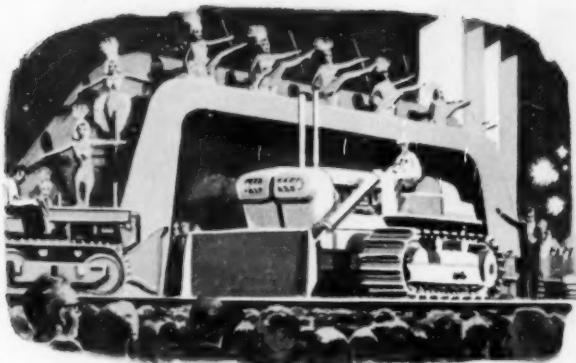
And a Complete Exhibition of GM's 7 Dazzling Dream Cars:

CHEVROLET BISCAYNE • PONTIAC STRATO STAR • OLDSMOBILE "88"
DELTA • BUICK WILDCAT III • CADILLAC ELDORADO BROUGHAM
LA SALLE II SEDAN • LA SALLE II SPORTS CAR

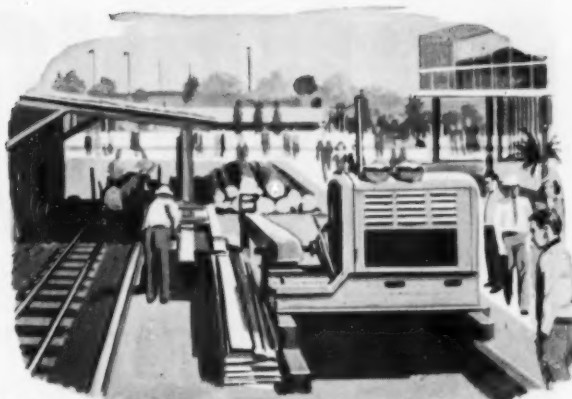


DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN
In Canada: General Motors Diesel, Ltd., London, Ontario



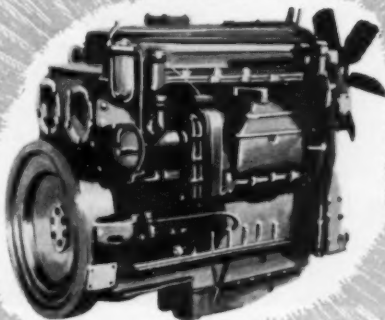
GM Powerama presents—"More Power To You"—a mammoth variety show in which Diesel-powered vehicles perform fantastic maneuvers—with Big Top circus acts and a huge cast of dazzling dancing starlets.



GM Powerama presents—a wide variety of interesting, operating exhibits showing the use of Diesel power in many fields including a sawmill, a cotton gin, an irrigation system, a farm tractor and a feed mill.

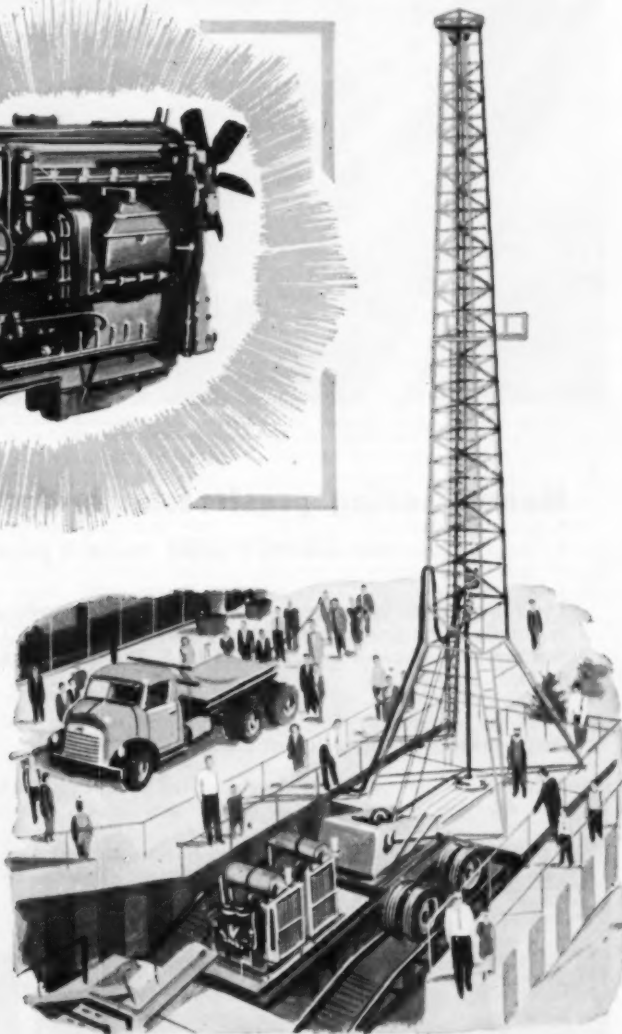
Horsepower

GM Powerama presents—at the head of the parade—Detroit Diesel's golden "6-71" Diesel engine (representing 100 Millionth General Motors Diesel H.P.). Also, Dr. Diesel's first engine and exhibits ranging from the 1933 World's Fair Diesel engine to the compact new "51" engine that opens new fields for Diesel usefulness.



GM Powerama presents—a marine display including GM Diesel-powered shrimp boat and 36-foot and 22-foot pleasure craft for the interest of those who want Diesel safety, speed and economy in their boats.

... for more details circle 192, page 16

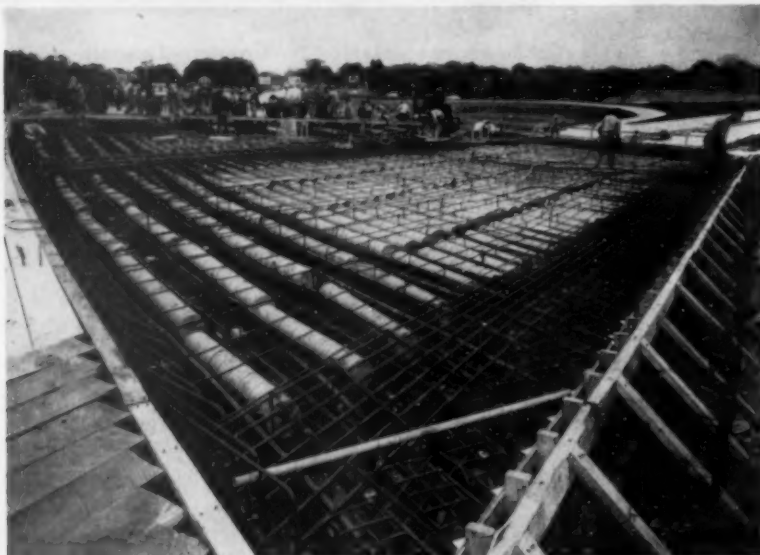


GM Powerama presents—a modern, portable oil-well drilling rig in action, powered by General Motors 2-cycle Diesel engines which have won a reputation for "more power in less space with less weight."

SONOVOID

FIBRE TUBES

for voids in concrete construction



Wough Memorial Bridge, Houston, Tex. Owned by City of Houston. Francis Niven, Engineer; Constructors, Inc., Contractors. Photo by Woodallen.

Money-saving prestressed bridge deck!

... low cost SONOVOIDS make it possible

The Wough Memorial Bridge in Houston, shown above under construction, reportedly is the first prestressed continuous bridge in the U. S. and the first prestressed voided bridge in the U. S. The voids were formed by 8" O.D. SONOVOIDS.

These low cost SONOVOID Fibre Tubes save concrete and reinforcing steel without impairing structural strength.

SONOVOIDS are specifically developed for use in concrete bridge deck, wall, floor and roof slabs... for precast units or units cast in place.

Supplied in specified lengths or sawed to your requirements on the job. Sizes from 2.25" to 36.9" O.D. up to 50' long. End closures available.

See our catalog in Sweet's

For complete technical data and prices, write

SONOCO PRODUCTS COMPANY
Construction Products Division

LOS ANGELES, CAL. 8005 SOUTH WESTERN AVE.	HARTSVILLE, S. C. — MAIN PLANT	MONTCLAIR, N. J. 14 SOUTH PARK STREET
AKRON, IND.	BRANTFORD, ONT.	

MEXICO: Sonoco de México, S. A., Apartado 10239, México, D. F.



... for more details circle 225, page 16

Mechanizing Records

(Continued from page 77)

Computation of gross and net earnings is accomplished automatically by the machine (a National "Model 31"), and, of course, the journal columns are also machine-added.

Machine System Advantages

Aside from low cost, the chief advantages are:

1. Type of records produced, which are extremely legible and provide easy reference.
2. Immediately accessible up-to-date figures available at any time.
3. Accuracy and dependability of cost records.
4. Preparation of all related records at the same time, which eliminates duplication and minimizes chances of error.

A further advantage lies in the fact that a machine of this kind requires little or no specialized training for operation: indeed it is much easier to teach a girl the machine method than to teach her the fundamentals of bookkeeping, which are definitely required for a manual system. If a girl can type and can operate an adding machine, she can also operate our typewriter-bookkeeping machine.

We have found that the mechanized system produces near-perfect records at less cost than the perhaps not so perfect records obtained through pen-and-ink procedures. Since other companies in this business have problems quite similar to our own, we feel that an investigation of a similar system might prove worthwhile.

New ARBA directory

The very popular and useful annual Directory of Highway Officials and Engineers, published yearly by the American Road Builders' Association, has been issued in the June, 1955, edition.

This roster includes the names and titles of all executive personnel in the State Highway Departments, the Bureau of Public Roads and the Principal turnpike agencies.

In addition to 1500 names of road building agencies, the booklet also includes the officers and directors of ARBA, and a new feature consisting of a tabulation by States of highway funds expended in 1954, and estimates of construction and maintenance expenditures in 1955.

Available at \$1.00 per copy, addressed to the American Road Builders Association, World Center Building, Washington 6, D. C.



- When maintenance work is conducted within the paved width, permanent signs equipped with flags and flashers warn motorists of the work ahead. First warnings set 200 ft. in advance, traffic cones and additional signs placed throughout.

Safety Program Halves Worker Accidents

Day-by-day vigilance, everywhere, is key to decisive accident reduction among New Jersey highway employees by concerted effort

By W. Carmen Davis

Engineer of Special Assignments, New Jersey State Highway Department

WORKING on the theory that worker accidents can be measurably reduced by concerted effort, the New Jersey state highway department is achieving an outstanding safety record among its 3650 employees.

During the 1954 year, for example, the frequency rate of accidents dropped from 21.57 per million man-hours to 11.02, a reduction of nearly 50 percent. During the same period accident severity, calculated on the basis of days lost per thousand man-hours, was reduced from .74 to .21, or roughly 70 percent.

When a record like this is established, it is quite natural to look for some radically new approach to an old problem, even a top secret formula. A look into the methods employed by the New Jersey department reveals nothing so startling. Some ingenious "gadgets" have been employed to reduce accidents, and more will be used as the need is shown. But primarily much of the success achieved to date is the result of outstanding employee cooperation, once the safe way was pointed out.

Safety education, as such, is administered in small, steady dosage, rather than in large quantities. In this way it is believed that safe prac-

tice can be made an enjoyable activity instead of a chore.

Motivation for the department's accelerated safety program stems from Commissioner Dwight R. G. Palmer, who learned the value of safe practices during a lifetime spent in private industry. When he retired as chairman of the board of the General Cable Corporation in April, 1954, Mr. Palmer was inducted by New Jersey's Governor Robert B. Meyner to head the state's highway department.

One of his early acts was to establish a completely equipped first-aid dispensary in the department's main office building near Trenton where 600 employees are housed.

In the adjacent equipment shops and testing laboratory, first aid rooms were set up under specially trained squads recruited from the regular work force. To assure prompt treatment of injuries and minor indisposition, a full-time registered nurse was added to the safety section of the office of personnel. Absenteeism has been cut down, as one dividend.

Perhaps the most substantial reduction in accidents has occurred among the department's field forces which constitute approximately half of the employee total. Maintenance workers were particularly prone to a wide range of accidents, most of which



- Flashing lights, flying flags, and bright yellow paint warn motorists of the slow moving grader working along the roadsides. Accidents involving motorists have been markedly reduced.



● Strained backs and crushed fingers are no longer the inevitable result of lifting inlet covers. A chain attached to the swinging arm on the side of each maintenance truck permits horse-power to replace man-power with little or no hazard.

were deemed preventable. An analysis of reportable accidents for 1953 was broken down as follows: eyes, 5%; head, 3%; arms, 6%; back and spine, 15%; trunk, 8%; poison ivy, 9%; hands, 8%; fingers, 6%; legs, 13%; feet, 9%; toes, 7%; and miscellaneous, 11%.

Studies of accident reports covering several years revealed that many injuries stemmed from a common cause. Numerous hand and finger cuts, for example, were traced to sharpening scythes with a hand stone. Similarly, injuries to the back and fingers often resulted from removing and replacing heavy cast iron inlet covers and pulling snow fence posts from the ground.

Roadside Talks

Whenever a common cause of injuries was found, safeguards were developed and their use explained in roadside talks. Often the solution proved to be the essence of simplicity. For example, scythe stones were fitted with discs cut from heavy blowout patches which acted as hand guards. A small swinging out-rigger on the forward right-hand side of maintenance dump trucks permitted catch basin covers to be lifted by attaching a chain and raising the truck body. Post pullers, operating on the lever principle, were made and distributed to all maintenance crews for use in taking down snow fence.

The result of using these and other ingenious devices was to immediately reduce injuries. But of equal importance was the knowledge that management was interested in employee well-

being and was doing something about it. When this fact was understood, a second benefit was noticed. Safety consciousness on the part of employees grew noticeably and they, in turn, devised many additional safeguards for their own protection. These were submitted for evaluation through the department's Suggestion Box and passed upon by the safety section prior to adoption.

Back in 1945 state department issued a Safety Manual for distribution to all employees. Although it clearly set forth accepted safe practices, the results obtained were far from encouraging. Reading a safety manual is a lot like reading a text book. Unless supplemented by proper

demonstration and competent instruction, the benefits obtained are highly questionable. All such programs must have top management support to succeed and to insure a realistic approach. That is why roadside talks were instituted. By explaining the right and wrong way — or the safe and dangerous way — to perform various operations, safety took on added meaning. But care was exercised to keep the educational dosage small and interest high at all times.

The Traffic Hazards

Maintenance workers and survey parties are required frequently to contend with unusually heavy traffic volumes in the performance of their duties. Daily travel on state highways averages 11,000 vehicles a mile — seven times the national average. At numerous locations peak traffic volumes of more than 100,000 vehicles a day are encountered. Such a situation presents special problems in traffic control and employee safety as shown by numerous accidents and fatalities in past years.

This problem was attacked from various angles and the recommendations of supervisors, foremen and maintenance workers sought. Out of a welter of ideas an improved system of advance warnings and traffic control was developed with one or two novel features incorporated. "Men Working" signs were redesigned to read "MEN AT WORK" and letter size was increased from 3½ to 5 in. for greater legibility. Sockets welded to the signs permitted two red flags to be inserted for additional warning. Additional traffic cones were utilized to channel vehicles into proper lanes farther in advance of the point of operations and all barricades were equipped with two or more flag sockets.

- (Left): Frequently cuts to hands caused by sharpening scythes in the field were eliminated when a simple hand guard made from a blow-out patch was slipped over the sharpening stone. "Gadgets" like this have materially reduced injuries. (Right): Here the simple principle of the lever is being used to save back strain in withdrawing snow fence posts from the ground. The post puller also saves posts. A simple chain clamp grips the post firmly and moderate downward pressure on the pipe handle does the rest.



At particularly hazardous locations special "knockdown" signs 6 ft. square were developed for use as advance warnings. These signs, mounted on skids for easy short distance towing, are equipped with battery-operated blinker lights as an extra warning to approaching motorists.

For the purposes of added visibility all highway department construction equipment and trucks have been painted bright yellow instead of the dark green, a color which was standard for more than a quarter of a century. And all equipment is now fitted with fore and aft blinker lights.

Although all trucks had been equipped for many years with emergency first aid kits, it was not until 1954 that a perpetual inventory system was set up to insure that kits were kept fully stocked at all times. This small detail — an award winning suggestion by an employee of the maintenance bureau — has permitted better treatment of minor injuries. As a future safeguard, steps are being taken at this time to require first aid training as a requisite to holding positions of foremen, assistant foreman and truck driver.

Organization-wise, the New Jersey State Highway Department's safety set-up is small. Officially, it consists of a safety representative and an assistant, both of whom were employed by the department in entirely different capacities prior to tackling safety. Aiding them as dispensary supervisor is the registered nurse. In addition, each bureau in the department has a volunteer safety representative who distributes posters, safety literature, and aids in coordinating the program.

Unofficially, however, there are hundreds of self-appointed safety representatives alert to the dangers of unsafe practices and doing their best to eliminate all accidents. To these anonymous safety crusaders goes a large share of the credit for any progress that has been made to date.

TRENCHING ON THE TURNPIKES AND THE THRUWAYS



↑ Herkner Construction Co.'s CLEVELAND cuts underdrain trench adjacent to a catch basin at Route 21—Turnpike Interchange.

One of four CLEVELANDS owned by Harry Miller Excavating Co. digging trench for drain tile on approach to Route 8—Turnpike Interchange. →



CLEVELANDS dig many miles of trenches required for Ohio's first Super Highway

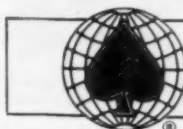
If you were to travel along the Ohio Turnpike *now*, while it is under construction, you could not go many miles on any part of it without seeing a CLEVELAND trencher or back-filler at work. These highly efficient machines are digging and filling many miles of trenches required for the drainage of water from the turnpike itself, as well as its interchanges, its overpasses and underpasses, and the approaches to them . . . plus many more miles of trenches for the restoration of farm drainage systems along the right of way . . . for relocating gas, water and oil pipe-

lines . . . and for installation of lighting cables, etc.

This widespread use of CLEVELANDS in the construction of the Ohio Turnpike parallels their extensive application in the building of such famous highways as the Pennsylvania and New Jersey Turnpikes, Oklahoma's Turner Turnpike and the New York Thruway. CLEVELANDS will continue to be important factors in the swift and economical completion of America's huge highway program for the future—the largest highway program undertaken in history.

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CLEVELAND

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105

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ROADS AND STREETS, August, 1955

Court Decisions That Affect Jobs

Is your asphalt plant safe from injunction?

By Francis George

Ore bad tempered neighbor can shut down the biggest asphalt plant if it is not properly located. The owner probably checks on zoning laws be-

fore putting a new plant into operation, but few check further, although zoning is only part of the picture.

Recently George M. Meyers Company set up a Barber-Greene hot asphalt plant on Missouri Pacific land near the tracks in El Durado, Kansas. The site seemed ideal, but the plant had been in operation for about a month when a neighbor about 700 feet away got a court injunction closing down the plant because of dust. Meyers proved in court that as a precedent railroad and city dump were both close by, but the court

made the injunction permanent and it took an appeal to the Kansas Supreme Court and a five-year court fight before the company could operate that plant.

In another case in Utah, where the county owned an asphalt plant and rock crusher, a neighbor got an injunction and no appeal has been able to shake it. The location was perfectly legal and the town had an interest in the operation, but the neighbor stopped it cold, because he proved "nuisance."

On the other hand the Asphalt Products Company has won several cases in Georgia when people have attempted to obtain injunctions and close down their plants. A judge there said that dust, noise, odors, are a necessary part of any manufacturing process and cannot be avoided except in unusual circumstances. The unusual circumstances that will make trouble must be brought up shortly after the plant commences operations. A sensitive person cannot buy a house next to a booming rock crusher and the next day get the rock crusher stopped because it disturbs him.

The problem doesn't exist for established units, but whenever expansion is planned, or especially when a new location is under consideration, the character of the neighbors should be calculated as well as the laws about building. The fact that an area is primarily industrial does not insure that an asphalt plant can operate, but does mean that with legal clearance it is more likely. In no case when a plant site was planned in a residential section has it been allowed against the protests of neighbors. Cases in industrial area got both ways, some judges allow it, some don't, a prudent business man will make sure of his neighbors before he puts any money into a new plant site.

If a lease can be gotten, insist upon a clause that makes the landlord guaranty the attitude of the neighbors; then if there is trouble the landlord can perhaps prevail upon his abutters and if not, the loss can at least be spread. But best of all, be sure before going to a new location.

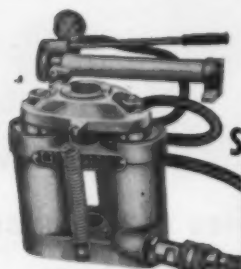
• The U. S. District Court of Western Pennsylvania has ruled that the government's failure to issue a deficiency notice permits the taxpayer to enjoin Internal Revenue Director's recovery of penalties imposed for failing to file declarations of, or pay installments of, estimated tax, or for substantially underestimating such tax. These penalties constitute "deficiencies" under Section 271 and 272 of the Internal Revenue Code of 1939.

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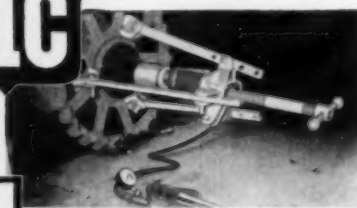
**SAVES
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OTC Puller Speeds These Jobs And Hundreds Of Others

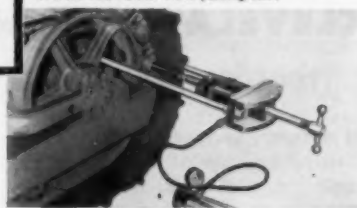
In the shop or in the field, portable, adaptable OTC Hydraulic Pullers push, pull, spread, press, lift or straighten. Whatever your crawler maintenance problem may be there is an OTC Power-Twin team of ram and accessories to do the job faster, safer without damage to parts. You will save 50 per cent or more on Down Time.

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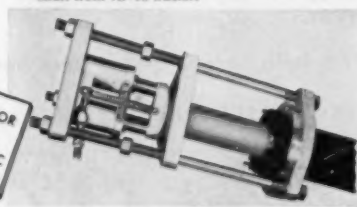
Removing crawler tractor sprocket with OTC 50 Ton Power-Twin pulling unit.



Same OTC puller with accessories removing track master pin.



OTC 100 Ton hydraulic unit removing pivot shaft from TD-18 tractor.



This OTC 50 Ton unit is the only tool that can remove and install International TD-24 Track and Accumulator Springs in the field. . . . for more details circle 218, page 16

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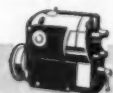
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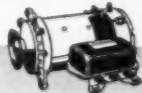
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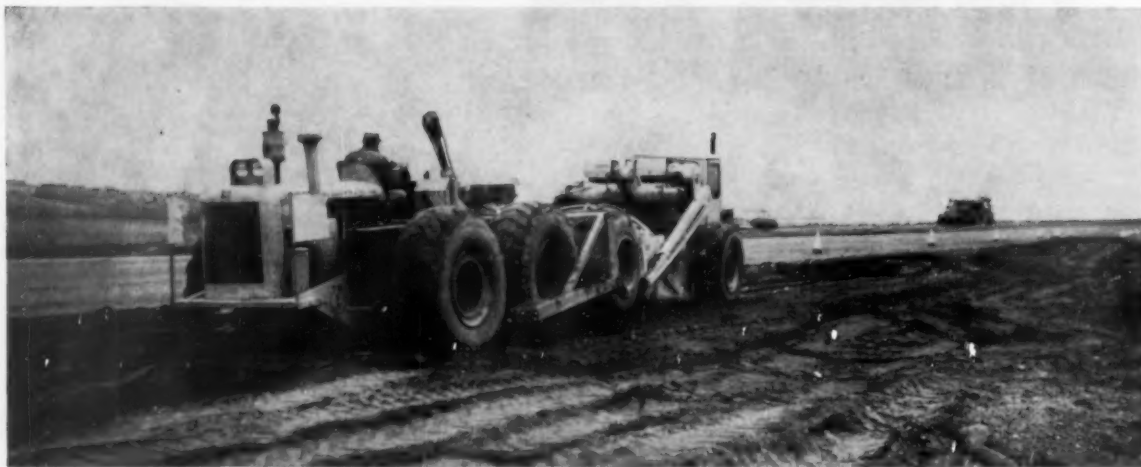
**Electric
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**Diesel Fuel
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. . . for more details circle 164, page 16

ROADS AND STREETS, August, 1955



● The answer to "how full the bowl" depends on haul length and other factors.

Is the Last Yard Worth the Time?

By R. C. Gessel

Field Engineer, LeTourneau-Westinghouse Company

JUST how long it should take to obtain an economical load in self-powered scrapers being push-loaded is an interesting, and sometimes surprising, job analysis.

Quite often the struggle for that last additional yard or so results in some doubtful economies. Staying in the cut or borrow area for greater periods of time may enable you to force a little more dirt into the bowl, but the advantage of that extra dirt packed into the bowl may be more than cancelled out by a longer cycle time and less yards per hour.

Let's analyze the problem for at least one set of conditions and determine just what it means in terms of additional yardage.

In the accompanying graph we have plotted yards per hour against increasing one-way haul distances, varying the size of loads and load times. All other factors are assumed to remain the same.

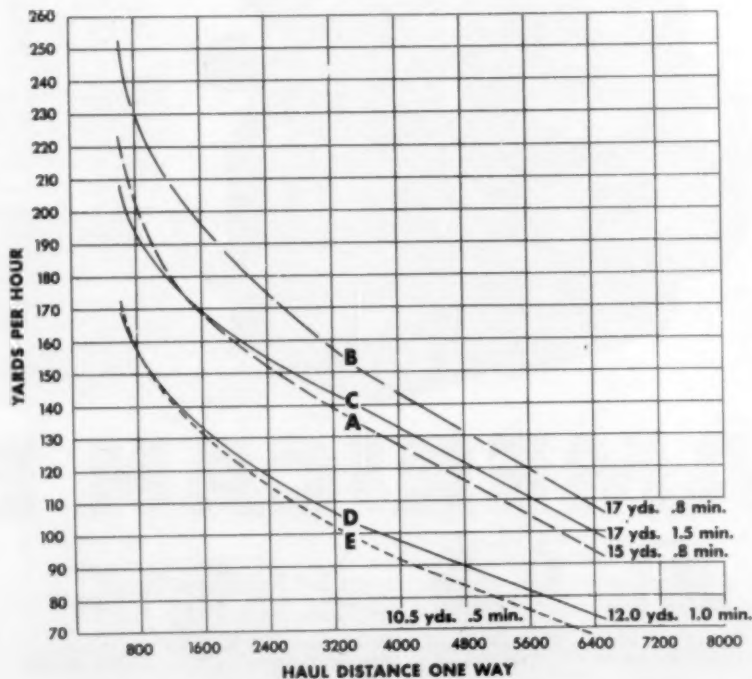
We have drawn curve "A" to indicate what a contractor may be getting in the way of production with a specific scraper and appropriate sized pusher. Curve "B" shows what might result if two more yards could be obtained with the same load time as the original condition.

Further considering curve "B" and "C," we have attempted to show a relationship between load time and size

of load as related to haul distances and other factors, assuming, of course, that we have at all times appropriate sized pushers with adequate power.

Curve "C" shows the hourly produc-

tion which is much more likely to result considering the additional time it takes to push the extra two yards into the scraper. Curve "C", then, indicates hourly production on a job where the pusher and scraper are struggling to secure that last yard or so, and the point at which it crosses curve "A" indicates the haul distance at which the



two load times produce equal hourly yardage.

This graph is not intended to show an exact breaking point for any particular scraper. Job conditions can change this considerably. However, in this instance we find on hauls up to 1,600 feet, production can be increased up to 24 yards hourly if we secure a fast smaller load. For distances beyond the 1,600 feet one way haul, it on the surface appears that it would pay to get the maximum load. However, this may not necessarily be true. Both curves are close enough together (within 5 yards per hour) for so great a distance that it would be quite easy to lose the additional yardages or fall below the values of curve "A" if other factors do not stay constant. Assuming that it visibly appears economical to struggle for that last yard, further consideration should be given to the overall picture. When scrapers and pushers are unbalanced, load times may need to be reduced since total fleet production can suffer when scrapers are waiting on the pusher. On the other hand, longer load times might pay off if pushers are idle awaiting scrapers.

Curves "D" and "E," drawn on the same basis for a smaller pay load, show that the breaking point for all scrapers is not the same. The conclusions are the same, however, except that the breaking point where reduced load time pays off occurs at different distances.

Apparently there is no hard, fast rule as to when it pays to haul larger or smaller loads. However, careful planning and job operation pays off. Each separate job must be carefully analyzed, taking into consideration such factors as:

1. Soil conditions (some soils load easier than others).
2. Size and condition of pusher (may be unable to secure maximum loads in economical load times).
3. Pusher waiting time.
4. Scraper waiting time.
5. Haul distances.
6. Skill of operators.
7. Expected additional maintenance on pusher and scraper for additional load times. (Loading is the roughest of all phases of the cycle.)

In conclusion, the additional time spent in getting the last yard or so will probably pay off on long hauls and conditions of no waiting at the pusher.

On short haul work or with insufficient pushers, getting what you can and getting going is good practice. Where the two methods cross is a matter of a little stop watch work for the particular project.

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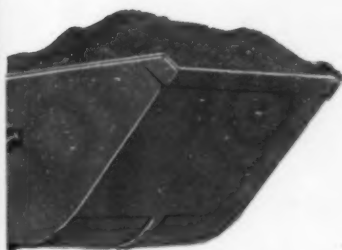
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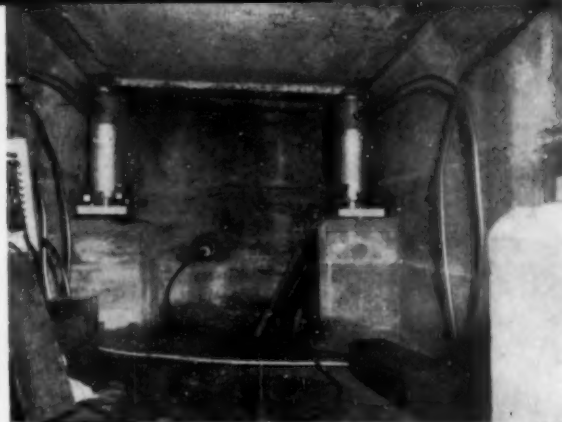
TRACTOR AND IMPLEMENT DIVISION

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BIRMINGHAM, MICHIGAN



. . . for more details circle 188, page 16



● Showing tape recorder which is the nerve center for data collection, and a view of the vault beneath the weighing slab, showing two of the four electronic cells.

Electronic Scales Speed Truck Weighing

ELECTRONIC highway scales have been installed in two states recently, as a means of simplifying the collection of truck weight and other data without causing traffic interference. Installed primarily as tools for highway planning, one of the devices is located on the Lincoln Highway near Tama, Iowa, and the other on the Wilsonville highway at Hubbard, Ore.

The scales were developed originally for aircraft weighing during the war and later adapted for use on railways. Highway planners from a number of states have been showing an interest in these installations, according to a bulletin from Cox and Stevens Division of Revere Corporation of America, the manufacturers.

The weighing platforms of these scales are imbedded flush with the road surface. The electronic scales automatically record axle weights, speed and other pertinent data as trucks move at normal speed. Con-

cealed under the surface of the road, the scale cannot be distinguished from an ordinary crack in the pavement. In addition to recording weight, the scale records the number of vehicles using the highway and their speed.

Original tests of the highway scale were made two years ago by the U. S. Bureau of Public Roads on highways outside Washington, D. C. in Virginia, under the supervision of O. K. Normann of the Highway Traffic Research Branch.

Known as the TR-1 unit the scale consists of a narrow level platform in the traffic lane, just wide enough to catch each wheel of the axle. This platform, 3'x10', is supported by electronic weighing cells capable of accurately and instantly transmitting the weight to a remotely located indicator where the weight is recorded automatically.

The electronic highway scale is said to have many applications. For research purposes, it will record axle



● Installing one of the electronic scales which include a concrete surface 3 ft. x 10 ft. platform.

weights, truck speeds, and axle spacings on a given roadway. This information previously was available only by count and sampling techniques, which were both laborious and expensive. Such complete data is expected to be very useful in planning and maintaining highway durability.

Used in conjunction with an overload detector, the TR-1 unit, will allow legally loaded trucks to by pass official state weighing stations. Now, all trucks must stop for the weighing procedure which results in costly delays even for non-offenders.

ELMER G. H. YOUNGMANN, formerly district engineer at Rochester for the New York Department of Public Works, has been transferred to the Buffalo district post. He succeeds Charles H. Waters, whose retirement was announced in July **ROADS AND STREETS**.



● A truck passing over a completed electronic scale installation.

New Publications

GEOLOGY IN ENGINEERING. By John Schultz and Arthur B. Cleaves; 592 pages; price \$8.75. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, New York.

This systematic account of geology from the civil engineering viewpoint is designed both as a text and a practical reference. The authors attempt to integrate geology and engineering, and to give a full account of geologic principles and methods for the benefit of the engineer; conversely, to discuss engineering methods of value to the geologist. The book places considerable emphasis on soils and the application of geology to soil mechanics.

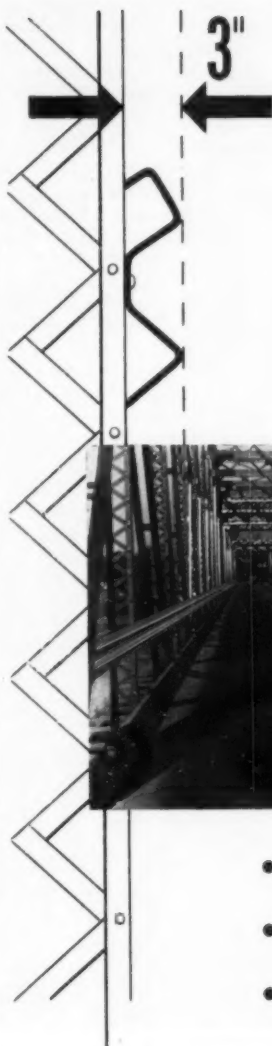
JOHN LOUDON MCADAM — FATHER OF MODERN ROADS. A small, popular picture booklet of this title edited and published for possible distribution by interested agencies, as a goodwill or educational gesture. The price ranges from 3¢ to 8¢, each, depending on quantity, according to the authors. For further information, write The Mercer Publishing Company, 16 East 52nd St., New York 22, N.Y.

BULLETIN 95: LABORATORY ANALYSIS OF SOILS. The Highway Research Board. This Bulletin presents two papers devoted to improvement in dispersion of soils in the measurement of grain-size distribution. It also presents one paper for extending the usefulness of the liquid-limit test by reducing the work of testing, thus making it possible to test a greater number of individual samples.

Since the early development of tests there has been almost continuous improvement in grain-size analysis and determination of liquid limits for soils. The test values have been used widely as indicators of potential behavior and also as practical values in specifications for control of the quality of soils for specific applications.

The papers presented in this bulletin are: "Dispersing Agents for Particle-Size Analysis of Soils," by A. M. Wintermyer and Earl B. Kinter; "Deflocculating Agents for Mechanical Analysis of Soils," by T. Y. Chu and D. T. Davidson; and "Rapid Methods for Determining Liquid Limits of Soils," by F. R. Olmstead and C. M. Johnson.

Price \$.60. Remit to the Highway Research Board, 2101 Constitution Avenue, Washington 25, D. C.



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. . . for more details circle 252, page 16

Personals

CHARLES R. WATERS, District Engineer for the New York State Department of Public Works at Buffalo, is retiring after 30 years of service in this position. He expects to continue in highway engineering and transportation fields, and may open an office for the practice of Professional Engineering. Mr. Waters who holds the Roy W. Crum Award and many other honors is widely known for his committee activity seeking national uniformity of signs and pavement markings.



C. R. Waters

BURTON MARYE has resigned as Chief Engineer of the Virginia Department of Highways to become Manager of the Richmond-Petersburg Toll Authority. He is succeeded by F. A. DAVIS.

Other changes in the Virginia Department lineup include G. L. NUNNALLY, appointed Purchasing Agent; ASHBY NEWBY, Assistant Purchasing Agent; and M. G. LYELL, Safety Engineer.

ALLISON C. NEFF, vice-president of Armco Drainage & Metal Products, Inc., Middletown, Ohio, was named president of the National Society of Professional Engineers at the annual banquet of the group in Philadelphia, June 4. Mr. Neff has served as vice-president of the Ohio Highway & Turnpike Association, and is president of the Middletown City Planning Commission, and co-chairman of the Middletown Industrial Council.

H. FRED WALLER, laboratory supervisor, Bituminous Research Department, North Carolina Department of Highways and Public Works, has been honored by fellow employees. He was given the McCrary award for outstanding service to the commission, in recognition of research on bituminous mixtures.

Correction to Article on Terrestrial Magnetism

The article entitled, "Terrestrial Magnetism, Its Cause and Cyclis Effects" by Halbert P. Gillette, which was published in July ROADS AND STREETS contained three minor errors.

Students of this subject will want to note the following correct wording of the third paragraph, second column, page 117, which is as follows:

"Since heat expands solid rock, how could the crust's diameter have been decreasing at that time? The answer puzzled the writer until it was remembered that when crystalline rocks are fused the density is considerably greater than when solid. Consequently when the molten core cools and solidifies, it crystallizes and expands. Conversely when crystalline rock adjoining the core fuses its density increases causing decrease in the diameter of the Earth."

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Now available as standard equipment on Thew-Lorain truck cranes, Models 524 and 425; or as optional equipment on Models 424 and 254. Kits for all models are also available for field installation.



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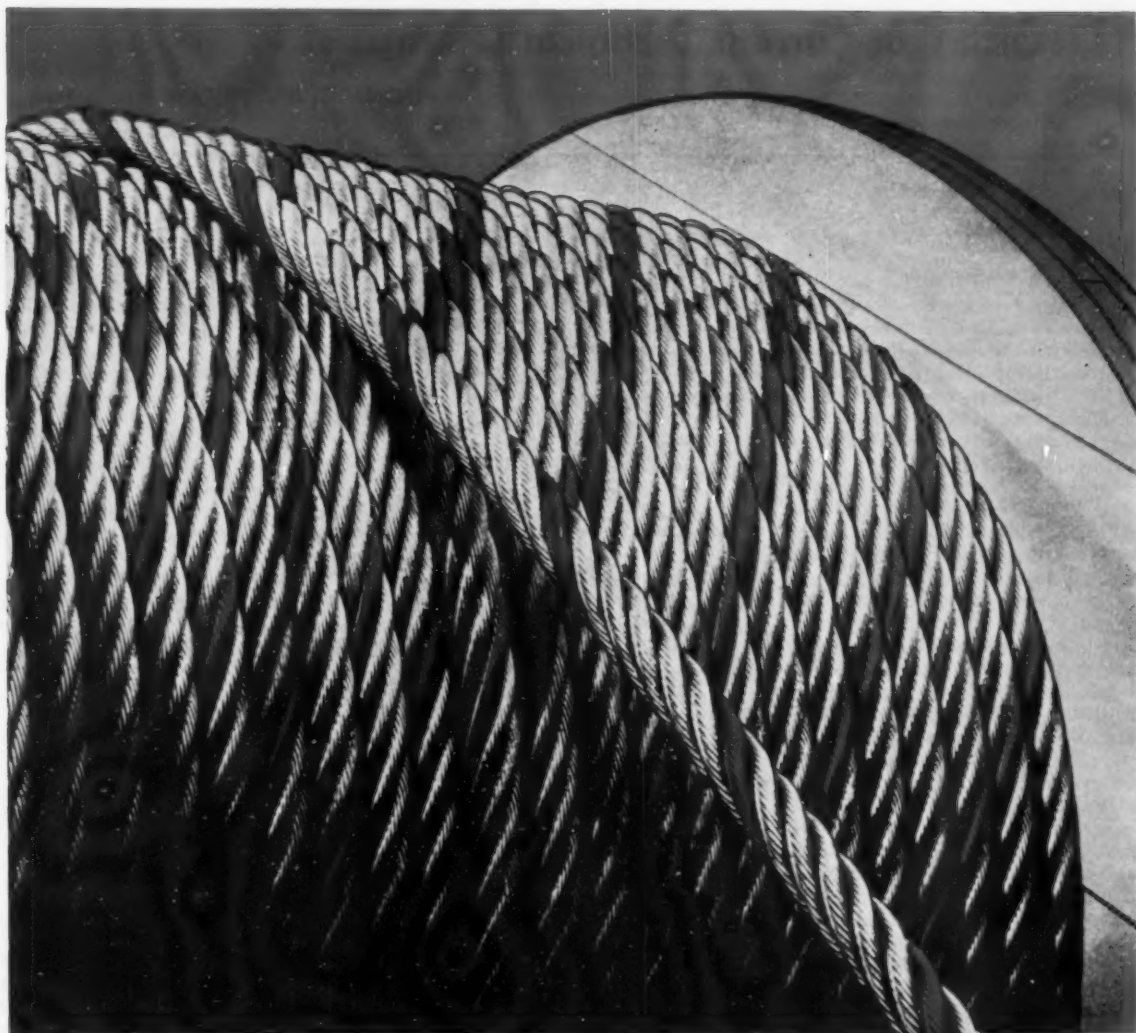
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... for more details circle 211, page 16

ROADS AND STREETS, August, 1955

DIGEST of Current Technical Literature

By JOHN C. BLACK, Associate Editor

British trends in concrete equipment

American manufacturers and engineers concerned with the development of concrete finishing machines and vibrators will find in this article a wealth of information on current conditions and prospects in Great Britain. It is not often that so complete and frank a statement is available.

Although the author does not so state, it may be presumed that present keen interest is stimulated by the prospect of resumption of major road construction, of which there has been none since the beginning of World War II.

To Americans looking at the British market (and other markets in Europe) stiff competition is indicated. The stress is on British and Continental products — particularly those from Belgium and Sweden, but with Germany, France, and Denmark also mentioned.

The author is sensitive to the relation between machines and methods, and makes plain his belief that if our finishers and vibrators are to be used extensively, modifications must be made either in the machines themselves or in British practice. In some cases he is specific as to what these changes should be. All this is without reference to competitive price.

Questions are raised on the relative economy of large and small machines but are not decisively answered in most cases. The value of large, American-type finishers on jobs of 2 miles or more is noted. Adaptation of vibration speeds and amplitudes to mix and other factors is considered—the range 1,500 to 18,000 cycles per minute.

There are frequent references to British and foreign manufacturers by name — some of them in tabular arrangement.

The main reference to this country is as follows: "American finishing machines are, of course, normally not suitable for use on road construction in Britain without modification. In the U. S. A. wetter and richer mixes are employed, largely because economic circumstances have been such as to allow them to be used. American machines, designed for these wetter and richer mixes, cannot be employed for compacting the dryer and leaner mixes employed in Britain. If suitable

finishing machines are not in fact available when required in Britain, the use of American machines may be possible (a) by altering the machines and the technique of employing them, or (b) by altering British mix designs to embrace American practice.

"If American finishing machines are to be adapted to suit British mix designs, it may be necessary to carry out a considerable amount of careful investigation and development. Probably there would have to be changes in (I) vibration frequency, and in (II) amplitude; in addition it would be necessary to determine (III) the number of passes required, and (IV) at what stage the various passes are to be carried out."

Regarding equipment now available: "A number of British manufacturing firms have in the past marketed compacting and finishing machines. A comprehensive survey was recently carried out by the author of this report and it was found that very few of these firms are at the present offering such equipment for sale."

The article occupies 7 pages, with a total of nearly 10,000 words and eight rather small pictures. Its anonymity is understandable in view of the many references to competing firms and products.

"Concrete Vibrating Equipment, Its Selection and Use" by Plant Engineer, CONTRACTORS RECORD and MUNICIPAL ENGINEERING, Lennox House, Norfolk Street, London, W.C. 2, England, April 20, 1955.

Lack of data hampers municipal development

In referring to the many needs for study and research on road and street problems, the speaker said:

"Another pressing problem requiring a major concerted effort is that of urban transportation. So evident is the need, I shall only mention the complexity and seriousness of the creeping paralysis threatening most American cities.

"Only bold and far-sighted expenditure of public funds on large scale improvements will alleviate the intolerable conditions presently existing. A program of such magnitude requires thorough engineering and economic

appraisal. But we face the fact that in most cities comprehensive, basic, urban-planning data are not available. Without it, municipalities are unable to properly evaluate present facilities, develop adequate plans for the future or enlist the necessary legislative support of physical and financial solutions.

"National committees are organized within the Highway Research Board and through the efforts of the American Municipal Association which promise the first basic attack on the urban problem."

Address of G. Donald Kennedy, Chairman, Executive Committee, at the January, 1955 meeting, Highway Research Board, Washington 25, D. C.

Fastener requirements for laminated timber

"This bulletin contains the results of an investigation of 119 laminated timber slabs tested at the Engineering Experiment Station of the University of Illinois. The slabs were constructed of laminations 2 by 4, 2 by 6, and 3 by 6 inches and were tested on spans of 3, 4½, and 6 feet. Variables considered were the type of fasteners (nails, bolts, or dowels) and their location in the lamination; the span length; the number of laminations in the slab; the material used (yellow pine, redwood, or Douglas Fir); the number of laminations to which the load was applied; and the effect of repeated loads. The principal portion of the investigation was concentrated upon the type and arrangement of fasteners.

"The test results were analyzed and compared on the basis of the effective number of laminations, that is, the number of laminations which, when considered as equally stressed, will produce the same maximum fiber stress as would be obtained if the actual distribution of the load among the various laminations was considered. For example, if the effective number of laminations is four, the loaded lamination should be designed to carry a fourth of the load.

"From the results of the investigation, the conclusion was reached that the important factor in the distribution of concentrated loads among

the laminations of the slab is the type and arrangement of fasteners and that the wood species used is of small importance. A common specification of 30d nails staggered at 18-inch spacing for nailing laminations together does not develop the strength of laminated floors to the fullest extent readily obtainable. Bolts and pipe dowels were somewhat more effective than 30d nails arranged in the same pattern, but their superiority over nails appears too small to justify their greater cost. The most satisfactory spacing of nails was found to be 9 inches, alternating between the top and the bottom of the slab (i.e., staggered); this spacing may be increased to 18 inches near the supports without any reduction in strength when a load at the centerline of span only is considered."

"The Distribution of Concentrated Loads by Laminated Timber Slabs" by Whitney C. Huntington, William A. Oliver, Melvin W. Jackson, William T. Cox. University of Illinois Engineering Experiment Station, Bulletin No. 424, Urbana Ill. April 1954. The above review is from HIGHWAY RESEARCH BOARD ABSTRACTS, February, 1955.

Subdivision control protects streets

All states except Vermont have enabling legislation for the control of subdivision platting. The courts have upheld such legislation and in general the local ordinances enacted under it.

In this paper a lawyer comments on accomplishments in this field, failures which have occurred in certain attempted controls, the blighting of areas by bad subdivision when control was lacking, and the rapidly increasing importance of requiring new land developments to conform to the general provisions of a master plan for the area.

It is noted that the basic problems lie generally in the field of engineering. Many of them relate to traffic safety, immediate or future. Where an area to be subdivided abuts an existing street or the location of a thoroughfare projected on a master plan, it is vital that the subdivider shall dedicate whatever area may be necessary for right-of-way or access.

Problems of the subdivider are noted: "I can think of a situation in Wisconsin where eight approvals from as many governmental units must be obtained."

But the primary consideration is that of public interest. "It is the thesis of this paper that some highway officials have not taken sufficient ad-

vantage of the subdivision-control tool. When raw land is being platted for development, the power to approve or disapprove the plat can be used to (1) require permanent setbacks and planting strips; (2) assure access protection even on nonlimited-access highways; (3) assure space for off-street parking; (4) control the angles at which side streets enter the main highway; and (5) assure adequate drainage, grading, and surfacing of streets within the subdivision."

The scope of the vacant land and improvement problem is suggested. "Ernest Fisher reported in 1923 that for the metropolitan region of Grand Rapids, Michigan, with a population of less than 22,000, the total investment in vacant lots and public improvements for these lots was in excess of \$26 million. (Fisher, Ernest M., *Land Subdividing and Rate of Utilization* — 1932)."

"Protection of Highways and Feeder Streets Through Subdivision Controls" by J. H. Beuscher, Professor of Law, University of Wisconsin. HIGHWAY RESEARCH BOARD BULLETIN 101, "TRENDS IN LAND ACQUISITION," Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. — 1955.

Route markers in varied colors through cities

Use of colors on route signs as an aid to through traffic in cities — especially where several coinciding routes produce a difficult or confusing number of signs — is being tried in Connecticut, Massachusetts and District of Columbia. Such trials are not new, but these three are being conducted in a way most likely to show what can and cannot be accomplished.

Color must be recognized as a supplement to, not a substitute for, the numerical system of route designations. It is a quick eye catcher to help motorists on their selected course, but the number of practical color combinations is so limited that numbers must also be available where needed.

Two general schemes are considered designation of each national or major state route by a single color or color combination for its entire length through the city; and the use of colors to indicate merely the four cardinal directions, with possible combinations for diagonal routes. Each system has both merits and defects.

It is the first of these, the straight-through color, which is being tried in Connecticut. Example, Route U. S. 1 is indicated by a typical shield-shaped sign with silver letters and numerals on a red background through all cities in the state. The city of

Providence, Rhode Island has cooperated by adapting the Connecticut color designations.

"Limitations in practical color combinations required assigning the same color to more than one major route; However, proper planning assured that within a specific urban area, no one color combination would appear on more than one route."

Color indications begin far enough outside the cities to give the motorist the correct idea of what to follow.

The District of Columbia uses color to indicate cardinal directions. Various reflectorized combinations were tried; some were unsatisfactory under daylight conditions, and some which were satisfactory in both daylight and dark were unsatisfactory in the dusk or half-light; however, four colors were finally selected as most satisfactory under all lighting conditions, i.e., blue, red, green and yellow.

The red color adopted has a somewhat brownish tinge to avoid confusion with red stop signs in the event that they become standard throughout the country. Limited tests, however, indicated that orange did not have as good legibility as yellow. Some difficulty was noted in differentiating between blue and green, but it appeared that this problem could be resolved by not having them appear on the same numbered route.

Among disadvantages in the cardinal points system is the fact that the geographic direction of route as indicated by color may be contrary to actual physical direction, as may be illustrated by U. S. 1 in Connecticut which is considered a north-south route, although through the entire state its general direction is east-west.

Massachusetts has experimented with color on both route markers and billboard type directional signs on their new expressways.

"Favorable comment was received following the initial installations both from motorists and the press.

"Later studies revealed a reduction in the uncertainty of motorists at the various junctions where varied colored markers had been installed."

The possibility is recognized that neither of these systems necessarily represents the last word in color signing.

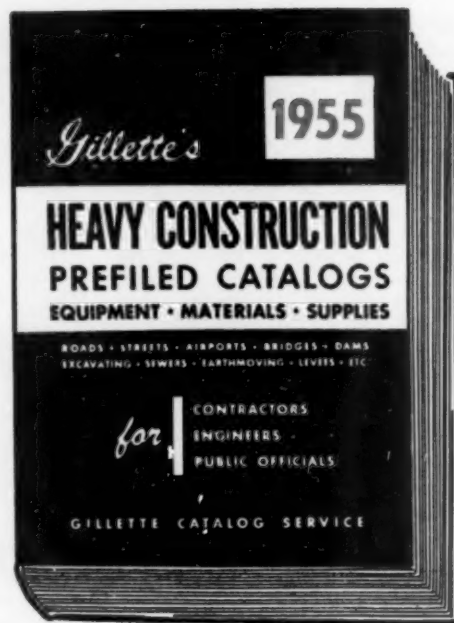
"A Report On the Use of Varied Color Route Markers in Connecticut, Massachusetts, District of Columbia: by Earnest W. Elliott, Junior Highway Engineer, Traffic Division, Connecticut Highway Department, PROCEEDINGS OF THIRTIETH ANNUAL CONVENTION, The Association of Highway Officials of the North Atlantic States, 1035 Parkway Ave., Trenton, N. J., 1954.

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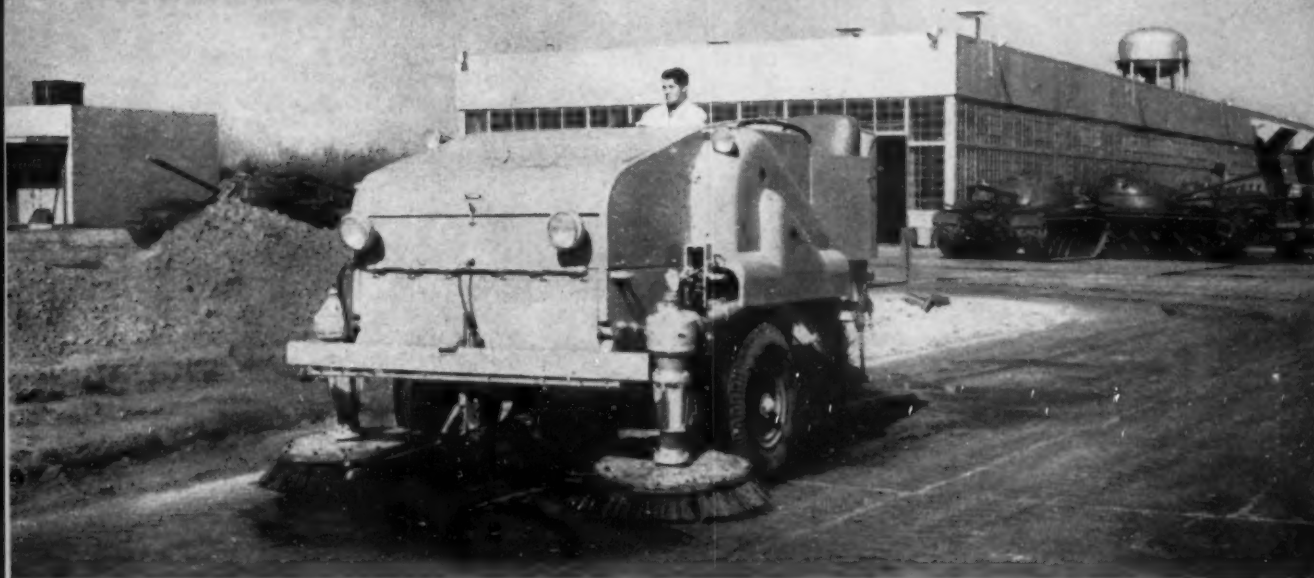


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Colorado Fuel & Iron Corp.
Concrete Surfacing Machine Co.
Continental Motors Corporation
Cummer & Son Co., F. D.
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Dorsey Trailers
Electric Tamper & Equipment Co.
Erie Strayer Company
Flexible Road Joint Company
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Gallion Iron Works & Mfg. Co.
Gar-Bro Manufacturing Co.
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General Motors Corp.
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Goodall Rubber Company
H & L Tooth Company
Harnischfeger Corporation
Heil Company

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at Newark, Delaware . . . Chrysler-powered Sweeper puts in full time keeping army tanks rolling

Clay can't stop a General Patton. But at the government tank plant at Newark, Delaware, clay from tank tracks cannot be allowed to accumulate. If it piles up on the test track, clay and mud might complicate test operations. And that's where the sweeper comes in.

For three years now, the Newark Plant has relied upon a single Wayne Sweeper to keep their mile-long

test track clean, their paved streets clear of debris. The job is a big one . . . it keeps the sweeper in operation eight hours a day, five or six days a week. Clay flattened out onto a concrete track is difficult to remove and the sweeper's double gutter brooms work hard.

The Newark Tank Plant's Wayne Sweeper has travelled some 46,000 miles in the performance of its job and is still going strong. Its Chrysler Ind. 32—265 cubic inch displacement engine has required nothing beyond routine maintenance care. Plant maintenance superintendent reports operating costs—gas and oil consumption—are light despite heavy operation.

Here again we see demonstrated the kind of service users can—and do—expect from good equipment, Chrysler-powered.

If you want to know more about Chrysler Engines as power for your equipment, write:

Dept. 128, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.

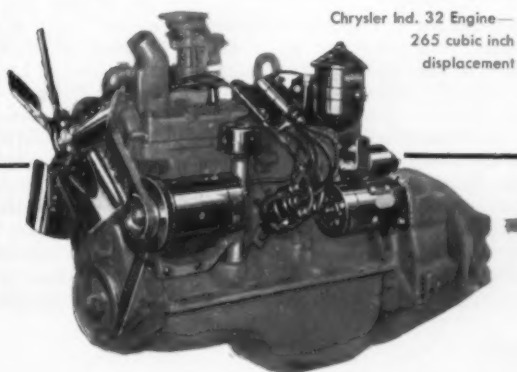


"One-Man Sanitation Department" . . . that's what they call the Wayne Sweeper at Newark, Delaware Tank Plant. Chrysler Ind. 32 Engine equipped with heavy-duty four-speed transmission powers brushes, hopper-filling mechanism, and travels the sweeper at traffic speeds. Sweeper is a product of the Wayne Manufacturing Co., Pomona, California.

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● The labor problem is a chief one in Latin America — due to language barrier, lack of training, different concepts, hunger and health problems.

PROBLEMS

By J. L. Harrison

Retired from Inter-American Division,
U.S. Bureau of Public Roads

WHY do American contractors — even very good ones — so often lose money when they venture into Latin America? The people there are friendly. Labor is plentiful, generally speaking, willing, and cheap. Weather, at least some of it, is good. And the materials to be handled — sand, rock, earth, steel, cement, etc. — are not too different from what one finds in this country. Conditions are reasonably normal in the conclusion of hundreds of contractors. But in spite of this, work has been taken at a loss more often than a gain.

Moreover, while such losses are of course more frequent among contractors unfamiliar with Latin America, the losses are so frequent and serious that some comment on the reasons for them may be of interest.

In Latin America labor is cheap and willing. Wage rates per day often are less, and sometimes a good deal less, than wages here are per hour. In the highway field at least the same machines are used as are used in this country, and the same methods of construction are in vogue. So the work offered there looks about the same as work of the same sort offered here. Probably a little more trouble with the weather. Doubtless a little more trouble with the tropical vegetation. A little more trouble to get materials and to get them onto the job. Still, as it appears there isn't any serious difference from the job back home.

Different Labor Conditions

But, has the situation been examined with sufficient care? As a start toward a somewhat closer examination, take the simple matter of labor. As a contractor you have employed and used hundreds of laborers — perhaps thousands. If you have worked in the North, you have worked with white labor. Would you expect to move into Georgia or one of the Carolinas, where your labor would be colored and, at once, begin to operate successfully? Or could you reverse

this move with success? Any experienced contractor knows that it is dangerous to step outside of his immediate working area — his home state and perhaps a few of the neighboring states — because, outside of this relatively small area, conditions usually differ just enough from those with which he is familiar to make an adventure into that area dangerous — financially, of course, not personally.

But if it is recognized that, in this country it is not wise to try to operate too far from "home base," how much more risk is there in attempting to operate abroad, perhaps several thousand miles from home, where customs are widely different, where the applicable laws and the practices as to their enforcement are different. Also where racially the labor is different — generally Indian — and where language differences may — in fact usually do — make it all but impossible for an American contractor to say a word his men can understand. And where the workers cannot be understood even if they should presume to speak to him — a thing they ordinarily would hesitate to do.

Unfamiliar With Jobs

But this is not all of his problem. What do the laborers know about work? Literally nothing. Have you ever tried to work with men who didn't know a pick from a shovel or why the simplest things the job involved were being done or how to do any of them. True, it is not often quite as bad today as this implies but the amount of highway work that has been done in Latin America has been so small that, outside of the larger cities, few unskilled laborers really have any understanding of what they are to do or any real familiarity with the tools they are asked to use. A few foremen are coming to have a limited — most of them still a very limited — knowledge of what modern highway construction involves. But by and large most of them know practical-

ly nothing about highway work. The great difference between highway labor in South America and the labor available in this country for similar work is that the labor lacks even a rudimentary understanding of what to do and how to do it. As a result, labor is hesitant just as it is in this country or anywhere else if it does not understand what is to be done. The lack of initiative — the tendency to hang back — which results, usually is laid to laziness or to dullness. One often is assured that labor is indifferent or worse. This is not a surprising conclusion but, generally speaking, it is quite an erroneous one. Remember that the American contractor quite generally must speak through interpreters who, themselves, seldom know much English — and that he is dealing with laborers who have little familiarity with what is to be done or how, it is not difficult to appreciate that the laborer must find himself working in the dark a good deal of the time. And this really is the situation. Labor in Latin America is willing enough and loyal. It is not abnormally inclined to loaf or to shirk. Apparent shirking means generally that management has not given enough attention to instructing labor in detail, with the result that the workmen lack confidence. All grades of labor require training — skilled labor and supervisory labor as well as unskilled labor, if the best results are to be secured.

Hunger also is often a factor overlooked. As compared with many parts of Asia there is little hunger in Latin America, but even at that there are thousands south of us who seldom have enough to eat. Those who customarily live on inadequate rations may or may not feel the discomfort of hunger and, to an untrained observer, may not look underfed. The man who is underfed cannot continue over extended periods to do a full day's work. Where they are well fed they can and do produce correspondingly. Of almost equal importance,

CONTRACTORS MEET IN LATIN AMERICA

turnover is definitely and materially reduced so, in practice, the burden and expense of breaking in and training new men is reduced because the trained men stay with the job.

The tendency among contractors seems to be to assume that if men look strong and well, they are. Very often, however, the contractor finds that they do not "stand up" to hard work and in such cases medical examination will usually show that they simply lack the strength to do a normal day's work. The laborers should be provided with a really (scientifically) adequate ration. When this is done they respond quickly and satisfactorily.

Another thing often overlooked is labor's health. Here at home, men expect to be reasonably well and, if they are not, they expect to go to a doctor to get medicine and advice. In most of Latin America (except in larger cities) doctors are scarce and the laboring man seldom consults one.

Health Program Needed

His wages do not enable him to pay doctors, even buy medicine. Labor often lacks punch and stamina. Probably malaria does the most damage, although when men are housed and fed in camps malaria now is relatively easy to control. However, it is not by any means the only disease which is prevalent enough from time to time to present a serious problem. Keeping a good doctor on the job and adopting modern sanitary measures helps but it is not a complete guarantee against trouble. The point here is that disease is a much larger factor in keeping work running smoothly in Latin America; it should never be overlooked. In fact disease adversely affects the cost at which work can be done in most of the countries South of us. Its effect is particularly bad in the wet tropics. The amount of work done is a very different story — a very sad story the contractor seldom has heard when he takes his first job abroad and would not believe if someone tried to tell him. Reasons? Several.

One, operators have been poorly and inadequately trained, and both job and work supervisors lack training and experience. Operators and supervisors lack personal experience with what really is good production. Hence, they are satisfied with rates of production per machine generally much below U. S. standards. This condition is hard to correct, so even

when American supervision is used, output per machine tends to remain low. Here the contractor moving into Latin America is caught on the horns of an interesting dilemma. If he decides to use so-called experienced local operators, of whom the number, though not large, is growing steadily, he finds them experienced only in low rate production and not inclined to accept higher rates. If he attempts to train his own operators he will find it a slow process not well adapted to use except on jobs likely to extend over a period of at least two or three years. In either case, then, he likely cannot escape low rates of production and the relatively high costs they involve.

Equipment Servicing Problem

Back home if a machine breaks down, what happens? The contractor or his superintendent jumps into his car and drives to the nearest town. There he picks up a telephone and calls the representative of the company which built the tractor and asks one very simple question — "Have you part number so and so for my xyz tractor?" If the answer is "Yes," he says, "I'll be right over and pick it up!" If the answer is "No" he asks the dealer to order it by wire to come out on the next flight. The part may be on the job before breakfast next morning — and the tractor in operation shortly after. Job production depends on it, so no manufacturer and no dealer can afford a record of any-

thing but quick accurate service on spare parts. It is vital.

In South America, if the tractor had broken down the contractor probably would have made no effort to use the telephone at all. More than likely there would, in any event, have been no telephone within miles of his job. Moreover, if there had been a telephone, service over lines outside of the large cities generally is so poor that one would hardly risk a message in which exact accuracy — as the number of a spare part — is required. Therefore, he would have gone to the company's nearest representative looking for the needed part. Usually he would not find it. The volume of business foreign dealerships handle does not, in many of the countries, justify any large investment in spare parts.

Also, the men who represent American firms abroad are just beginning to gain an understanding of the normal relationship between the sale of new machines and the stocking and sale of spare parts for them and to pay a reasonable amount of attention to the spare parts end of the business. But, even this does not yet help too much, for if spare parts are to be handled effectively they must be handled by men who know something more about them than the numbers shown in the spare parts catalog. Actually, there are very few places where spare parts are available in anything like adequate number, or are handled by men having any real understanding

Some of the Headaches on Latin American Jobs

- *Labor is cheap and willing — but completely untrained and unoriented in modern construction.*
- *Language barrier is formidable between management and workers.*
- *Physical hunger is a common reason for inability to do a day's work.*
- *Health problems can and often do stop the crews. A company doctor is a good investment.*
- *Operators are not geared to U.S. concepts of job speed.*
- *Parts are weeks away instead of hours — yet a company parts inventory can soon get out of hand.*
- *Extra mechanics and shop facilities may run up costs.*
- *Careful and realistic advance planning is essential.*

Different "Logistics" in Latin Countries

There is another whole field — the field of logistics — in which foreign operations differ widely from operations at home. Logistics may be defined as the art of getting things to the right point in the right quantities at the right time. For the ordinary highway construction job this normally is not too much of a problem in the United States, where sources of supply are well developed and where transportation facilities are quite adequate to meet almost any demand which may be made upon them.

But in many places abroad the situation is very different. Roads are not good. Often there are no railroads within any useful distance of the job. Commercial sources of supply for such com-

modities as sand, stone, gravel and lumber to say nothing of such manufactured products as steel and cement are either inadequate, unsuitably located or simply nonexistent.

Therefore, for the most part, materials which can be produced locally must be and all other materials and all tools and all equipment must be moved to the job in the best way possible which will ordinarily mean moving them relatively long distances over poor roads or worse.

Most modern equipment uses gasoline or diesel power so all fuel and oil must also be hauled long distances and to avoid the effect of irregularities in delivery rather large storage facilities are desirable.

of the merchandise with which they are dealing.

The writer recently encountered rather an amazing illustration of the effect of trying to operate a parts department without having a parts man in charge. In this instance a contractor needed blades for his scrapers. Having been repeatedly advised that no blades were in stock and that none were coming in, he ordered from an independent source in the States. Some months later one of the contractor's men, in going through the dealer's stock room, ran across the missing blades — several hundred of them! — stacked in an out of the way place. No one in the stock room had the least idea as to what they were!

If the dealer cannot find the needed part or does not have it, it must be ordered from the factory. And that is just the beginning of the transaction. You, as a contractor, have of course asked that the order be cabled in with instruction to ship by air express. At the outside the delivery of that spare part should not, you think, require over three or four days. Certainly, from the transportation standpoint it should not take longer than that.

Three or four or five months later in desperation you again (you have inquired many times before this) go to the dealer and insist on an explanation of why that spare part hasn't arrived. Then it develops — most interesting — that the dealer has no more credit with the manufacturer than you have at the Post Office. That means a letter of credit or

some other recognized commercial document. There are such matters as export licenses, forwarders documents, export declarations and a lot of other papers which it takes time to prepare! These and many other things must be done to get even the most necessary spare parts.

Of course, as contractors become familiar with this situation they do whatever they can to offset it. But it must be faced. Extra mechanics can be and are employed. Shops are set up in which many parts are made. Parts are welded. In short, whatever can be done to offset the difficulty of procuring spare parts for jobs abroad is done.

What Can Be Done

Out of the fact that the difficulties which are encountered in getting the spare parts to keep the machines running, add substantially to the cost of doing the work, and to the risk involved, there comes a natural and perfectly logical question as to whether anything can be done about it. The service on equipment abroad must be materially improved or our export business in roadbuilding equipment will be lost and that in the rather near future. Up to the present time foreign manufacturers — German and English for the most part — have given American manufacturers of roadbuilding equipment little competition, but that condition is changing. Over the next five to ten years, at least, this competition may be expected to continue to grow. For that

reason it seems to the writer that, among the many things American manufacturers should consider most carefully as methods of protecting their foreign business in roadbuilding equipment two stand out (1) stocking dealers adequately on a consignment basis — that is goods to be carried at the cost and risk of the manufacturer and paid for only as sold, and (2) the maintenance of spare parts depots at one or more free ports.

It is not the intention to discuss these plans of operation here. Suffice it to say that both plans, among other things, place spare parts in locations from which they can be moved to the job without the interminable delays now encountered. Both of these plans also transfer the cost of maintaining the large stocks of spare parts. It is necessary to have to keep a fleet of equipment of various types and sizes in operation, on the manufacturers. That they are more able, financially, to do this than the distributors are, can hardly be questioned. That the better service to the contractor which could be provided under either of these plans, is important, and is likely to be increasingly so as competition increases, is hardly open to question.

Careful Planning Necessary

It will be seen that these problems do not differ in their general nature from day-to-day problems, here in this country. Therefore the tendency is to feel that they are more numerous than important — that, after all, with proper attention to detail, their effect can be limited to a reasonable increase in the cost of handling the work. Actually, this is the fact. Careful planning and careful execution of the plan will bring the costs here involved under control but a good deal of experience is required before plans for work in this field can be made with anything like accuracy, so, the contractor going for the first time into an enterprise abroad is likely to find it an expensive adventure. Men really reliable and well informed as to how logistics problems can best be solved are truly scarce and very hard to find.

The comments made above do not present a complete answer to the question as to why American contractors so often lose money on Latin American work. They do touch on some of the major reasons and, to that extent, may prove useful. The fact remains that new conditions require new methods and that, too often, contractors looking south see the similarities with conditions with which they are familiar rather than the differences between them. It is the differences that are most important.



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"Practically eliminated our downtime"
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"There's no tougher test
for tires than anthracite
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truck for a 7-hour shift—
for a \$400 loss. But U. S.
Royal Con-Trak-Tors
have practically elimi-
nated our downtime."



Down Goes Downtime!

The new U. S. Royal Con-Trak-Tor—Full Lug, an important result of U. S. Royal's 4-Year Truck Tire Project, is cutting equipment downtime 'way down for leading operators like Corraale Construction Company.

Good reasons, too! The Con-Trak-Tor's *Nylon cord carcass* stands up to vicious shocks, shrugs off rocks and snags. It has *triple impact protection*—extra rubber between plies, double shock-pads under the tread, extra-tough construction at the crown. Its *full lug traction* pulls right through toughest going, just *won't bog down!*

Why not let the Con-Trak-Tor prove it can reduce *your* downtime, lower *your* operating costs? Your U. S. Royal Dealer has this great tire in your size. Have him put it on your wheels—and prove to yourself why leading operators like Corraale Construction Company report they're *well ahead* with U. S. Royals!



U.S. ROYAL

NYLON CON-TRAK-TOR FULL LUG

ASK YOUR U. S. ROYAL DISTRIBUTOR TO SHOW YOU THE NEW FILM ON BETTER HIGHWAYS, "MEMO TO MARS"
... for more details circle 238, page 16
ROADS AND STREETS, August, 1955

TAILORED POWER



FLEXIBLE POWER is the key to profitable hauling today. A vehicle must have the *workhorse pulling power* to haul heavy loads! *Torque* is needed for bad road conditions or hill-climbing! *Speed* is needed for fast hauling, to bring an empty vehicle back for new loads sooner.

TDA 2-Speed Axles answer trucking's need for flexible power. Exclusive double-reduction design permits a range of spreads all the way from 28% to 49% ... in an almost unlimited number of gear combinations. TDA allows tailoring the power of your truck to meet any variety of hauling conditions.

COMES TO TRUCKING

with TDA 2-speed axles

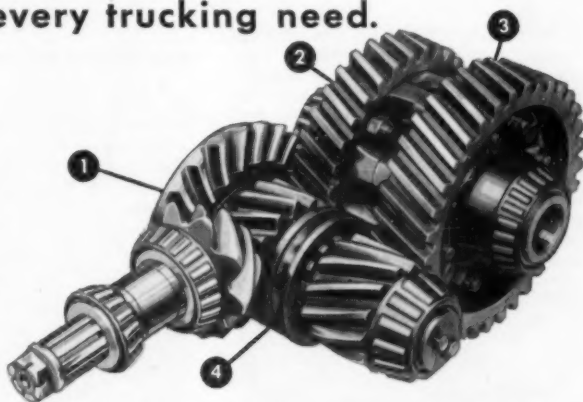
Exclusive, double-reduction design offers almost unlimited possibilities of gear ratios and ratio spreads—this versatility provides tailored power for every trucking need.

How TDA's extra "spread" works to your benefit. All 2-speed axles employ an extra set of gears to give two ranges of speed or power to choose from . . . one for *pulling power*, the other for fast speed. Most 2-speed axles offer only one choice of "spread"—37%. Design limitations prevent changing this standard "spread".

However, TDA uses the exclusive double-reduction design. With TDA, spreads are available all the way from 28% to 49%. This means that your axle can actually be tailored to give you just the power you need. Not only can you specify the spread most suited to your immediate trucking need—but you can easily *change* from one spread to another by merely changing the low speed helical pinion and gear—an *easy mechanical change*.

TDA's more efficient use of engine power gives important benefits . . . high road speeds, faster deliveries, better payload, and maximum fuel economy. No matter what your hauling problem or load/road conditions you save with TDA.

How TDA's 2-Speed principle works! A husky hypoid ring gear and pinion set (No. 1 above) provide the *first step* of the total gear reduction for both fast and slow ratios. Two large, heavy-duty helical gear sets provide the *second*



step. Both sets are of balanced size and capacity. One set (No. 2) is for fast speed; the other (No. 3) is for slow speed. The clutch collar (No. 4) power shifts to right or left to engage one helical pinion or the other.

Greater endurance, longer truck life with TDA. TDA's simple design eliminates small complicated parts and midget size gears. Large hypoid-helical design provides more teeth in contact—quieter operation and far less strain. Bearings are larger, too. All this adds up to more profitable operation under all conditions.



World's Largest Manufacturers of Axles for Trucks, Buses and Trailers

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

©1955 R.S.A. Company

. . . for more details circle 233, page 16

Increase axle life with GENUINE TDA EQUIPMENT PARTS

Take no chances with ordinary replacement parts. For sure, dependable, factory-type jobs, specify genuine Timken-Detroit Axle parts kits—identical to your axles' original equipment.

Each kit is complete—gives you everything you need in one handy package. Gaskets and shims, brake liners and rivets, steering knuckles, king pins and bushings, differential nests—for every

size of brake and axle. Order by number from your dealer. Cut labor and adjustment costs. Get trucks back on the road quicker.



What's New in Equipment and Materials

(See Page 16 for Reader Service Coupon, more items page 156)

Hydraulically Controlled Drag Scraper

A new $\frac{3}{4}$ yd. scraper, claimed to have 50% more carrying capacity than the conventional $\frac{3}{4}$ yd. scraper, is now being manufactured and marketed by Leland T. McGee Manufacturing Co., Inc., 410 Dixon Ave., Compton, Calif. This McGee Model "N" is actually five implements in one: 1 - Scraper. 2 - Scarifier. 3 - Scarifier and Scraper (in combination). 4 - Floater and Finisher. 5 - Backfiller. It is specifically designed for the new 600, 800 and NAA Series Ford tractors.

A distinctive feature claimed for the McGee Model "N" is the live rocking-working action at the operators' command. This is made possible through the top power link which replaces the Tractor's top link. The top power link is controlled by the new McGee gold seal valve. The top power link will work on any three-point tool designed for these new Ford Tractors, and this link is instantly adjustable from 19 in. to 28 in. by finger-tip pressure on the gold seal valve control.



McGee $\frac{3}{4}$ Yd. Model "H" Scraper

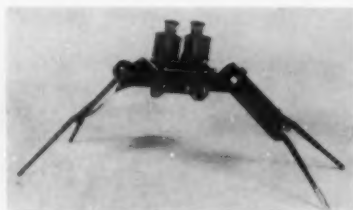
For more information circle 106 on Service Coupon Page 16 and mail now.

Instruments for Aerial Survey Work

Coincident with the widening application of aerial survey work in the construction industry, a new line of Hugo Meyer photogrammetric stereoscopes and rangefinders has been announced by Meyer-Opticraft, Inc., 39 West 60th St., New York 23, N.Y.

These instruments are designed for all phases of the industry, from the bid to the last step in final construction. They are at present extensively employed by many agencies of the government for work on dams, highways, bridges, soil conservation, forestry, municipal planning, rivers and harbors, etc.

Brochure, available from Meyer-Opticraft, describes both the observation and map plotting type of instruments. Information also covers ground ranging equipment. The illustration shows the mirror-type stereoscope with accessory



Mirror-Type Stereoscope

binoculars for viewing 9 x 9 aerial photographs in three dimension.

For more information circle 107 on Service Coupon Page 16 and mail now.

Heavy Duty Rock Ripper

A new heavy duty ATECO rock ripper, designed to take full advantage of the new Caterpillar D8 tractor's increased work power, is now in production by American Tractor Equipment Corporation, 9131 San Leandro Blvd., Oakland 3, Calif.

The new unit is a heavier duty version of the ATECO rock ripper for standard D8 tractors in use for the past two years. Improvements include a stronger tool beam, thicker-sectioned ripper shanks, heavier drawbar plate, and renewable wear pads on the swinging brackets. Hydraulic system includes latest design pump, which is 25% more efficient, runs cooler, and reduces power required.



New Ateco Rock Ripper

As in previous units, ripper shanks are especially curved to aid penetration and to produce an underground "quivering" action which shatters rock and other hard materials for easy scraper loading. Shanks are equipped with extra-heavy rock-splitting boots and points. Shank has two adjustments, one for 18 in. penetration, and the other for 24 in. depths; 30 in. depth available on request.

For more information circle 108 on Service Coupon Page 16 and mail now.

Welding Rod for Rebuilding Heavy-Duty Equipment

The new Mir-O-Col No. 13-S developed by Mir-O-Col Alloy Co., Inc., 312 North Ave. 21, Los Angeles 13, Calif., is designed for high speed rate of deposit on heavy-duty equipment such as

grader blades, shovel bucket lips and similar hardworking equipment.

A self-hardening rod designed for electric only, Mir-O-Col No. 13-S is highly alloyed to produce a tough, shatter-proof deposit. Rockwell C scale 50-55. The rod can be applied with AC or DC, reverse or straight polarity.

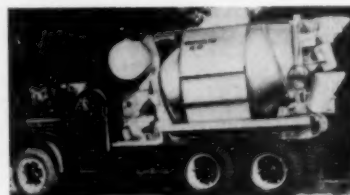
Highly abrasive and shock-resistant, the new Mir-O-Col No. 13-S is an extrude electrode with an alloyed coating containing chromium, manganese, silicon, boron, molybdenum and carbon. The electrode may be deposited equally well by using a stringer or weaving bead.

For more information circle 109 on Service Coupon Page 16 and mail now.

8 Yd. Truck Mixer

A new, standard 7½-8 yd. Hi-Up truck mixer, announced by Worthington Corporation's Concrete Machinery Division, Plainfield, N.J., features a heavy duty, single lever operated transmission; with forward and reverse clutches, and drum and brake gears totally enclosed in a continuous oil bath. A new style distributing chute is incorporated which extends approximately 8 ft. when hinged chute is open and over 11 ft. with the extension chute. Height adjustment of the chute is simplified by the addition of a new, ratchet type telescopic chute support.

The new mixer is furnished with either two compartment water measuring tanks, or flush tanks, calibrated to within 1% accuracy. Water injection is accomplished by use of a "grout-out," double seal water bell in the drum head, or by hopper water injection. Mixing drum construction is of wear resistant Mantel steel with $\frac{3}{8}$ in. thick, automatically welded shell and $\frac{1}{4}$ in. thick drum with die-formed ribs. New die-formed "sure contour" blading is stated to provide proper mixing in a minimum charging time and rapid discharging on even the most difficult slumps.



New 7½-8 Yd. Hi Up Truck Mixer

For more information circle 110 on Service Coupon Page 16 and mail now.

Motor Grader Has New Oil Clutch

The oil clutch that has proved such a success in Caterpillar track-type tractors is now being introduced in the No. 12 motor grader as standard equipment. Caterpillar Tractor Co., Peoria, Ill., has begun production of the improved machine and will introduce it to the field at no additional cost to the customer.

In principle, the oil clutch in the No. 12 motor grader works as follows. A separate pump, incorporated with the engine oil pump, supplies crankcase oil

to the clutch. When the clutch is disengaged, oil surrounds the clutch discs, cooling the facings. The two driven discs on the No. 12 have special resilient organic material facings bonded to them in which are a network of grooves to permit the oil to escape during engagement.

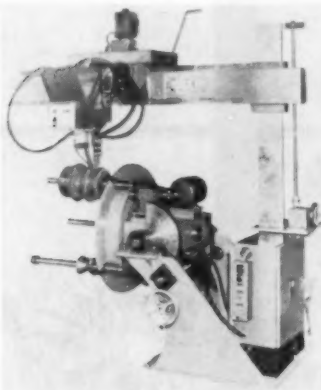
The free, circulating oil quickly dissipates the heat generated through the friction of engaging and disengaging the clutch. It also acts as a lubricant for all moving parts, including the pilot and throwout bearings. As the clutch discs move to the engaged position, the facings are "oil protected." Once the clutch has been engaged, the friction surfaces are rendered completely free of oil because of the pressure between the plates.

For more information circle 111 on Service Coupon Page 16 and mail now.

Tractor Roller and Idler Rebuilder

A special machine designed primarily to weld tractor rollers and idlers but which can be used for numerous other hard facing and automatic welding applications, has been developed by C. B. Herrick Manufacturing Corp., 2000 Center St., Cleveland, O. The machine is of heavy welded steel construction consisting of a base, tilting and rotating work table, vertical column and lateral travel carriage beam. The vertical adjustment of the beam is motorized and provides a working range of 42 in. The beam has been designed to accommodate the travel carriage and automatic welding head furnished by the welding equipment manufacturer. The travel carriage may be welded or will provide automatic variable speed movement laterally. Travel of 42 in. is possible on the beam. The ram may be moved easily 360 degrees around the column so that welding can be accomplished behind or on either side of the machine.

The work table has a capacity of 500 lb. By using a tailstock or outboard bearing, a 1,000 lb. load may be rotated when the table is tilted at 90 degrees.

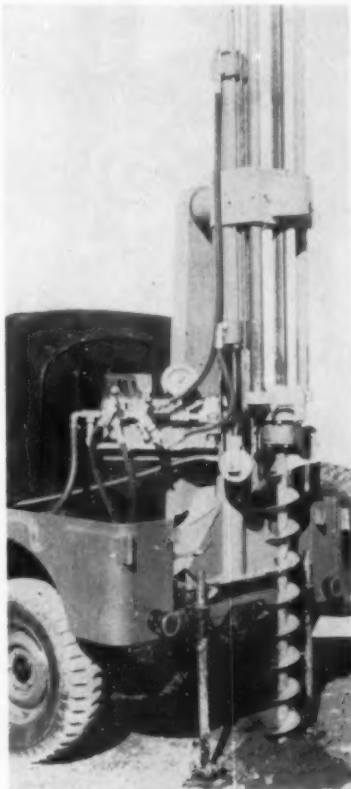


Automatic Roller and Idler Rebuilder

For more information circle 112 on Service Coupon Page 16 and mail now.

Earth Drill

A new earth drill for mounting on either a 2 or 4-wheel drive vehicle, announced by Continental Equipment Sales, Inc., 1810 N. 12th St., Toledo, O., is stated to combine rugged construction with relatively light weight. The drill can receive its power from a power take-off of a vehicle or from another power. It is stated that the drill in addition to boring into the ground with continuous flights of augers, can perform rock drilling with the insertion of drill rods in the hollow rotating drill stem and the attachment of either diamond or steel drill bits, using chilled steel shot as the drilling medium.



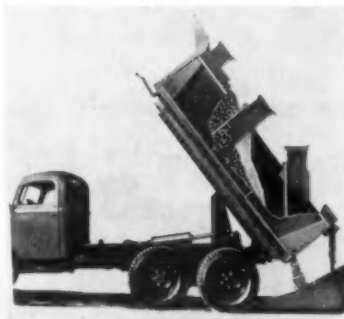
Toledo Earth Drill Mounted on a Jeep in Drilling Position

With the use of suitable bits, the unit can drill cores in pavements to a maximum diameter of 6 in. Designed by men who regularly investigate soil and rock sampling, the drill is stated to readily penetrate earth to a depth of more than 100 ft. and rock to a depth of more than 300 ft. when using diamond bits.

For more information circle 113 on Service Coupon Page 16 and mail now.

Cement Box for Aggregate Transportation

A new-type cement box for use on trucks in transporting aggregates to skip mixers on construction projects has been developed and is being marketed nation-



Cut-Away of "Cem-Matic" Cement Box Showing Operation

ally by the Dravo-Doyle Co., Fifth Ave. and Liberty Ave., Pittsburgh 22, Pa. The all-steel box, attached to the partition gates on batch trucks, not only facilitates loading and unloading of cement but also mixes it with the aggregates when dumped. The boxes, which weigh 250 lb., each have a 15 cu. ft. capacity. They are 71-in. wide, 34 $\frac{1}{2}$ -in. high, and 14 $\frac{1}{2}$ -in. deep.

The aggregates are loaded in the truck first thus putting pressure against the doors of the cement box keeping it tightly shut. During unloading, as the truck bed is raised for discharging a batch into the skip mixer, the aggregates flow out, releasing the pressure on the cement box doors. The cement starts to flow after about 4 to 5 cu. ft. of aggregate has been unloaded. The cement forms a blanket over the aggregates. A cover keeps the cement box weathertight. The box is quickly removed for normal dumping and handling jobs.

For more information circle 114 on Service Coupon Page 16 and mail now.

Metal-Backed Rubber Chute Lining

A metal-backed rubber chute lining that can be used as a basic construction material and can be installed on existing or new structures has been placed on the market by Goodyear Tire & Rubber Company's Industrial Products division, Akron 16, Ohio. Called "Armaplate," the new product consists of abrasive resistant rubber bonded to hot-rolled steel. It can be formed, sawed, sheared, rolled, bent and punched like sheet steel. The new chute lining can be bolted or tack welded.

It is stated that with Armaplate no foreign matter can become lodged between the metal and rubber bond. Another advantage is that an operator can use the product as it comes if he wishes, instead of applying rubber lining to a metal chute, hopper or bin.

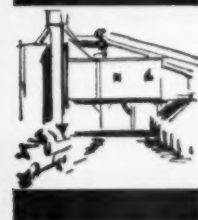
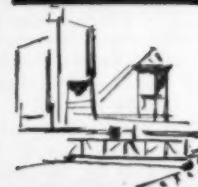
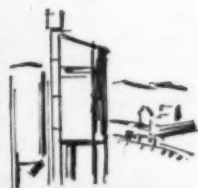
Armaplate is being marketed in four sheet sizes 48 by 180 in., 48 by 144 in., 36 by 180 in., and 36 by 120 in. The four sheet sizes will be available in four overall gauges: $\frac{1}{4}$ in., $\frac{1}{2}$ in., $\frac{3}{4}$ in., and 1 in., including the 1/16 in. steel plate.

For more information circle 115 on Service Coupon Page 16 and mail now.

New Heltzel



Heltzel's 100 ton three compartment Type-3 portable aggregate plant equipped with two 1½ yd. fully automatic batch truck batchers. The plant features Heltzel electronic controls which enables one operator to dispatch eight batches per minute.



portable highway paving plant

DELIVERS THREE ACCURATE BATCHES EVERY 25 SECONDS ON TURNPIKE OPERATION

Keeping two dual drum pavers working simultaneously calls for fast batching; working to turnpike specifications calls for accurate batching; working paving contracts calls for portable equipment.

The new Heltzel Series III Batchmasters are the fastest, most accurate, portable batching plants available today. That's why, when Central States Construction Co. was awarded a contract on the Ohio Turnpike, they came to Heltzel for their batching equipment.

Heltzel designed a 440 bbl. plant, with storage facilities for an additional 2000 bbls. of cement, that will deliver *three batches, discharges into a truck, every 25 seconds* with an accuracy to within one-tenth of one percent. The plant is exceedingly portable, designed for quick erection and dismantling. It is fully automatic, interlocked with provision for immediate manual operation in case of power failure. It is complete with a Heltzel 325 bbl. per hour elevator. Automatic 16 cu. ft. batchers are equipped with 1000-lb. easy-to-read dial scales and the exclusive Heltzel Combination Rotary Feed Tubular Valve, which makes possible this great speed and extreme accuracy.

The aggregate setup consists of a Heltzel 100-ton, three compartment plant with 2 one and one-half yard fully automatic aggregate batchers equipped with 5000 x 5 lb. dial scales. The plant weighs and discharges an amazing *eight complete batches per minute* to an accuracy of one-tenth of one percent.

Central States has operated the plants in paving 300,000 yards of concrete, running them to capacity 10-12 hours at a time, without let up, and find they meet specifications in every way.

If you want speed and accuracy, big capacity and portability, look over the new Heltzel Batchmasters before you buy.



Heltzel 400 bbl. Portable E-2 Plant with two 1050 bbl. recirculators and a 325 bbl. per hour Heltzel cement elevator. The plant is equipped with two fully automatic 16 cu. ft. cement batchers featuring electronic controls and the exclusive Heltzel Combination Rotary Feeder Tubular Valve.

THE HELTZEL STEEL FORM & IRON CO.

45000 Thomas Road • WARREN, OHIO

... for more details circle 197, page 16

Electric Scedd Package Assembly

An electric scedd package assembly has been placed on the market by Stow Manufacturing Co., 65 Shear St., Binghamton, N.Y. When mounted on a beam, this scedd can be pulled along by two men, striking off the concrete smoothly and at the same time vibrating the concrete.



Stow Electric Scedd

The electric scedd consists of: A 1 HP totally enclosed electric motor with a thermo overload switch and a cord with complete twist lock plug — and a vibrating unit that delivers 5100 vibrations per minute, brackets for mounting the motor to the beam and all necessary bolts, a pair of end rollers, handles, and all necessary bolts.

On many jobs, this scedd package can be just bolted to any beam. However, for some slabs where the surface must be perfectly flat, a prestressed beam can either be ordered from Stow or built by the contractor. Complete drawings and directions for building a prestressed scedd beam are given on the back of Stow's Catalog No. 552. The motor is available in either 110 or 220 volts, single or three phase.

For more information circle 116 on Service Coupon Page 16 and mail now.

Big Timber Production Saw

The Model 5MG, a custom-built, two-man, 10 HP big timber production saw has been added to the MG chain saw line of Mall Tool Co., 7725 South Chicago Ave., Chicago 19, Ill. Its gear transmission, which lets the bar swivel 360 degrees to cut at all angles with a level engine, can be detached for easy two-man toting in rough terrain.

This new saw incorporates the numerous engineering innovations recently perfected by Mall engineers.

The 5MG has a Mall-built, time-tested,



Model 5MG Saw

work-proved, 1 cylinder, 2 cycle, air-cooled gasoline engine. Stalling is prevented by an automatic clutch, which stops the chain and lets the engine idle while cuts are being changed. The saw has a standard float type carburetor and a built-in trigger type throttle for right or left hand use. Its chain is $\frac{3}{8}$ in. pitch double-life chrome-plated side planer.

For more information circle 117 on Service Coupon Page 16 and mail now.

Portable Storage Tanks for Construction Jobs

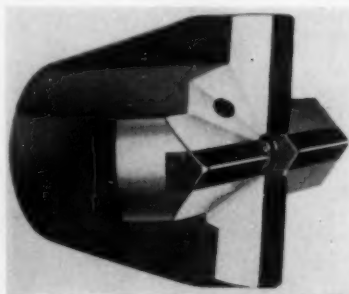
Collapsible storage tanks for storing bulk liquids as an emergency or temporary measure are now in production for commercial use by Goodyear Tire & Rubber Co., Akron 16, O. The tanks can be used on remote construction projects for gasoline or fuel oil storage to meet emergency conditions.

The pillow-type tanks, originally developed for military use, are constructed of two layers of fabric reinforced synthetic rubber, vulcanized into a single unit. The inner layer of fabric consists of a gasoline barrier imbedded between two layers of gasoline resistant synthetic rubber. The portable tanks are being manufactured in 900, 3,000 and 10,000 gal. sizes, with larger and intermediate sizes available on special order.

For more information circle 118 on Service Coupon Page 16 and mail now.

X-Type Rok-Bits

Designed for use on the new, larger machines, Brunner & Lay offers the new X-type, tungsten-carbide Rok-Bits. They are available in 3 $\frac{1}{2}$, 4 and 4 $\frac{1}{2}$ -in. gauge sizes, to fit on 1 $\frac{1}{2}$ and 2-in. drill rods.



X-Type Rok-Bit

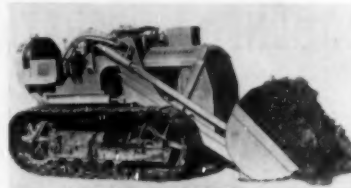
These bits are now made to fit directly on the steel of two machines, eliminating the use of expensive adapters. The X-type Rok-Bits feature a new body design, new job-fitter carbides, the manufacturer points out. Descriptive bulletin B-1 available from Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill.

For more information circle 119 on Service Coupon Page 16 and mail now.

Front End Loader Attachment

Specially designed for use only on Cat wide tread, long track, D-2 tractors, with non-oscillatory frame, the new fully-hydraulic T. L. loader of Teale & Co.,

P.O. Box 308, Omaha, Nebr., is claimed to have fast speed-of-lift and increased maneuverability. Characterized by the clean lines and clever, simple design of its new inside mount, the rugged, high-quality construction of the new TL-20 is stated to provide fine job-performance and unusual durability. All hinge points are zerck lubricated, and are fitted with heavy-duty, over-size pins and replaceable bushings. And the finest hydraulics, including Hydrex valves, is stated to guarantee continuous, high speed operation.



Teale TL Loader

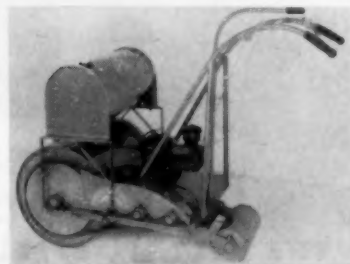
The TL-20 is stated to lift $\frac{3}{4}$ yd. of material to a clearance of 9 ft. (measured at bucket hinge-points) in a fast 6 seconds, with break-away power at ground level of 5,000 lb., and 3,000 lb. of guaranteed lift to the full 9 ft. height. The following Teale attachments can be used with the TL-20: Rock bucket, light-materials bucket, sidewalk snow plow, lumber fork, logging fork, and scarifier and rippers.

For more information circle 120 on Service Coupon Page 16 and mail now.

Power Roller for Small Jobs

A new power roller called the Roll-Master, introduced by Hardsog Pneumatic Tool Co., Ottumwa, Iowa, is designed to do the many small jobs in construction operations. The company states it is particularly suited to driveways, walks and curbs; also, hot or cold asphalt street repairing.

Built for rugged and dependable service, the Roll-Master is stated to handle all these applications with equal ease and efficiency at weights up to 1,000 lb. A water tank for hot asphalt provides extra weight when needed for other jobs. When moved from one area to another the machine easily pulls itself up into the truck.



The Roll-Master

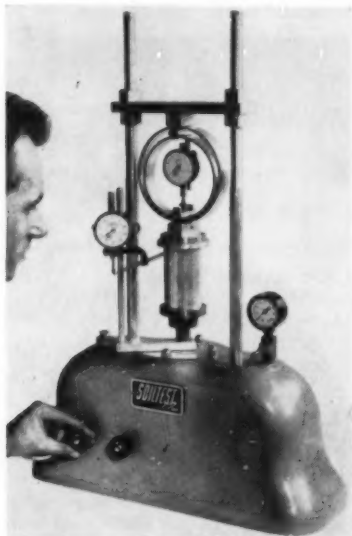
For more information circle 121 on Service Coupon Page 16 and mail now.

Compression Tester for Soils

A new portable unconfined compression testing machine for soils developed and manufactured by Soiltest, Inc., 4711 W. North Ave., Chicago, Ill., makes possible rapid job site or laboratory testing to determine stress and strain relationships of soils for foundation design and construction control.

The hydraulically operated tester has a total load capacity of 500 lb. Loads are measured on a sensitive double proving ring assembly. Specimens up to 2½ in. in diameter can be tested.

The portable testing machine has a one-piece aluminum base with integral air and fluid reservoirs. Total weight is only 35 lb.



Compression Testing Machine

For more information circle 122 on Service Coupon Page 16 and mail now.

Hard-Facing Alloy for Construction Equipment

A new low-cost low hydrogen hard-facing alloy for application to working surfaces of construction, mining and aggregates handling machinery and similar heavy-duty equipment where impact and wear resistance are required is available from Wall Colmonoy Corporation, 19345 John R St., Detroit 13, Mich.

The new iron base chrome-molybdenum-silicon alloy, known as Colmonoy No. 2, is available for general purpose hard-facing application to manganese and other steels in the form of AC-DC electrodes. These electrodes are stated to be of special value in extending the life of such equipment components as tractor treads, dipper teeth, ditcher teeth, muller tires, scraper knives, truck beds, rasp bars, dragline buckets, scraper blades, snow plow blades, driving spindles, shovel boom sockets, car couplers, pinion wobblers and asphalt mill liners.

For more information circle 123 on Service Coupon Page 16 and mail now.



Lima Type 24 Jobmaster

½ Cu. Yd. Shovel; 15-Ton Crane

A new ½ cu. yd. power shovel, 13 to 15-ton capacity crane, known as the Lima Type 24 Jobmaster, has been introduced by the Construction Equipment Division of Baldwin-Lima-Hamilton Corporation, Lima, Ohio. Representing the smallest unit in the Lima line, which includes a 6-yd. shovel and 110-ton crane, the new machine is available with crawler or rubber mountings and is readily convertible to shovel, crane, dragline or pull shovel application. On a truck or wagon mount the Jobmaster crane has a lifting capacity of 15 tons at 10-ft. radius. As a crawler crane it has a lifting capacity of 13 tons at 10-ft. radius.

This streamlined, air controlled unit, designed for mobility, high output, speed and low cost maintenance, employs machine cut gears, large diameter brakes and clutches in the hoist, crowd and retract and swing and propel mechanisms, independent boom hoist with engine controlled boom lowering, differential tractor-type steering, independent combination chain and cable crowd and retract, internal-external tooth jaw clutch for quick engagement and minimum backlash in gear train, liberal use of anti-friction bearings, heat-treated ground shafting and floating steel disc type dirt seals in tread rollers. Optional features include independent propel, auxiliary third drum and power load lowering.

Maximum overall length of the standard crawler truck is 10 ft., 2½ in. and

the overall width is 8 ft. with 16-in. treads.

As a shovel the Jobmaster is equipped with a 16 ft., 6 in. boom and 13 ft., 3 in. dipper handle. Crane booms, pin or bolt-connected, with all-purpose point shaft are available from 30 to 80 ft. A 10-ft. jib is available. Counterweight combinations are readily removable. Diesel or gasoline power plants are available.

For more information circle 124 on Service Coupon Page 16 and mail now.

"Fade-Out" Tracing Paper

A drawing and tracing paper with "disappearing" grid lines is now available in rolls. This time-saving "fade-out" paper is printed with light-blue cross section rulings which completely disappear on direct print reproductions and blue prints.

Using the printed grid as a guide, scale drawings are easily and accurately made, and freehand lettering quickly applied without the need for penciled guide lines or mechanical scaling aids. Reproductions of the original drawings are sharp, clean and entirely free from cross section rulings. Pencil and ink lines can be erased repeatedly without "ghosting," assuring clear, easy-to-read prints.

Catalog including sample sheets and prices may be obtained by writing the manufacturer: Clearprint Paper Co., Dept. G7, 1482 - 67th St., Emeryville, Calif.

For more information circle 125 on Service Coupon Page 16 and mail now.

Lower operating costs for 4 W.Ds plus amazing pep, handling ease

WARN HUBS STOP FRONT END DRAG IN 2-WHEEL-DRIVE!

Over 70,000 satisfied owners know it pays to install Warn Hubs! With Warn Hubs, 4-wheel-drive is used only when needed for traction. Most driving is in free-wheeling 2-wheel-drive with the entire front drive train disengaged. There's no drag, no gear whine, no shimmy. Tires wear longer, gas mileage goes up, front end repair costs are cut way down. And 4-wheel-drives have the pep, speed, performance and handling ease of pick-ups! Warn Automatic Hubs also permit high speed driving in 4-wheel-drive—a real advantage on or off the highway. Automatic or Locking (manual) drive selection models available. Fully guaranteed. Willys models factory approved, sold only by Willys dealers worldwide. Models for other 4 W. Ds at truck dealers, or write:

WARN MANUFACTURING CO.
Riverton Box 6064-RS, Seattle 88, Wash.



WARN HUBS

- REDUCE FRONT END WEAR 50% OR MORE!
- INCREASE GAS, TIRE MILEAGE, ENGINE LIFE!

ASK YOUR DEALER FOR
FREE DEMONSTRATION

... for more details circle 257, page 16



PROLONG
PRODUCTIVE LIFE
of
**WORN SHOVEL
and
DIPPER TEETH**

MANGANAL

T. M. Reg. U. S. Pat. Off.

11% - 13½% Manganese-Nickel Steel

WEDGE BARS

- We'll be happy to tell you how to save money by repointing worn teeth with Manganal Wedge Bars. Write today!

STULZ-SICKLES CO.

SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

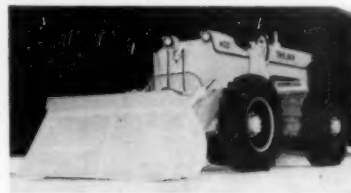
NEAREST DISTRIBUTOR
UPON REQUEST

... for more details circle 229, page 16

Shovel-Type Loader Has Torqmatic Transmission

Contractors Machinery Co., Inc., Batavia, N.Y., manufacturers of Trojan loaders, has announced the newest addition to its line of rubber tired shovel-type loaders. This is a 4-wheel drive machine, known as Model LT-400, and has a capacity of 1½ cu. yd. It is equipped with Allison Torqmatic transmission which permits shifting from forward to reverse at any time without stopping the machine. It can also be shifted from low to second, or to travel, at any time.

This new loader embodies all the features common to Trojan loaders including the patented reverse curve safety arms, independent bucket action, low load carrying position and straight line horizontal thrust.



Trojan Loadster, Model LT-400

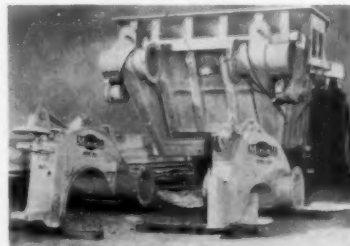
The addition of the Model LT-400 completes a range of bucket sizes from 12 cu. ft. to 1½ cu. yd., both 2-wheel and 4-wheel drive.

For more information circle 126 on
Service Coupon Page 16 and mail now.

Interchangeable Yokes for Movall

Interchangeable yoke sections to fit Caterpillar DW20 and DW21, and similar prime movers are a new feature of the Movall power ejection and dump wagons of CTD Manufacturing Co., Perkins, Calif. Changeover from scrapers to Movalls or vice versa can be made by two mechanics in 4 to 8 hours in the field. Movalls use exactly the same front end arrangement as the scraper; no modifications or extra assemblies are required.

The same basic Movall can be used interchangeably with either the Caterpillar DW20 or DW21, or any prime mover with sufficient horsepower and double-drum cable control, merely by installing the proper gooseneck.



Goosenecks for DW21 on DW20
Cat Tractors

For more information circle 127 on
Service Coupon Page 16 and mail now.

5-Roller Oscillating-Type Track Roller Frame

A new five-roller, oscillating-type track roller frame is now available as an attachment for the Caterpillar D4 Tractor, according to an announcement from Caterpillar Tractor Co., Peoria, Ill. Installation of this track roller frame on the D4 will provide increased traction, greater flotation and better stability, particularly when the unit is operating in hilly terrain and locations where soil conditions are soft or unstable. A tractor equipped with a five-roller track frame requires a 34 section track in place of the 31 section track included on the standard four-roller machine. If large idlers are used, a 35 section track can be installed. Light-type roller guards are available as attachments for use with the five-roller track frame. Also available for use with the five-roller track frame are the new tool bar and tool bar bulldozer arrangements. The draft members of this tool bar are longer to permit a single position for the trunnion plates, making possible rapid changeover from front to rear operation by simply swinging the draft members to the desired position.



Five-Roller, Oscillating Type Track Roller Frame on D4 Tractor

For more information circle 128 on Service Coupon Page 16 and mail now.

Tractor Has Major Design Changes

Caterpillar Tractor Co., Peoria 8, Ill., has announced that the DW15 tractor, just completing its first year in the field, has undergone some major design changes. Designated the new DW15 (Series C) tractor, it will feature a new 186 HP, 5 $\frac{1}{4}$ x6 $\frac{1}{2}$ in. engine — improved in design to give even greater service. Included in the changes is a new transmission case, designed to assure positive lubrication under the most adverse operating conditions.

The new DW15 (Series C) tractors will be equipped with the proven No. 27 cable control for more positive scraper response and increased cable control clutch and brake life. The cable saver will be standard equipment with No. 15 scrapers.

For more information circle 129 on Service Coupon Page 16 and mail now.



Pave the way for jets!

...with these **FLINTKOTE** Products!

Provide resistance to fuels, oils, greases in critical areas. When it's time to scramble, have pavements ready!

FLINTBINDER* C-2... a specially compounded hot-mix tar-rubber binder for jet fuel resistant flexible pavement. Used as surface course or overlay on asphaltic or portland cement concrete. (Meets Corps of Engr.'s specification for tar-rubber binder).

FLINTSEAL* JFR... jet fuel resistant hot-poured compound... that seals joints in concrete pavements to keep out moisture and incompressible debris. Used extensively by U. S. Air Force on concrete runways, taxiways and aprons serving jet aircraft. (Meets Fed. Spec. SS-S-00167.)



Flintbinder C-2 jet fuel resistant pavement being laid on one of many large U. S. Air Force Bases.

FLINTAR†... specially compounded coal tar emulsion for surface sealing asphalt pavements on service areas subjected to jet engine fuels, oils, greases and engine cleaning compounds. Squeegeed on surface, it increases pavement life. (Meets Fed. Spec. R-P-00355.)

Consider these and other Flintkote paving products for your airfield or highway projects. Write for technical data and literature.

*Reg. U. S. Pat. Off. †Trademark of The Flintkote Company

FLINTKOTE



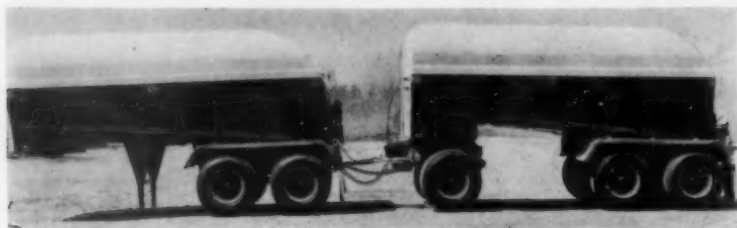
THE FLINTKOTE COMPANY, INDUSTRIAL PRODUCTS DIVISION
30 Rockefeller Plaza, New York 20, N.Y.

BOSTON • CHICAGO HEIGHTS • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA

In Toronto, Ontario: THE FLINTKOTE COMPANY OF CANADA, LTD.

In London, England: Industrial Asphalts Company, Ltd.

... for more details circle 187, page 16



Bulk Cement Transporter with Airslide Unloading in its Twin Panel Form as Adapted for Train Use.

Bulk Cement Transporter

A new bulk cement transporter, now in production by Fruehauf Trailer Co., Detroit 32, Mich., embodies the advantages of both the "Airslide" methods of unloading and the strong, rigid, lightweight Aerovan structure.

This cement transporter has a 100 to 120 bbl. capacity. In its single panel form it is housed within an Aerovan structure. The 24-ft. container can be located backward or forward within this framework for the most effective load distribution.

The efficiency of this unit is evident from the fact that it can unload 120 bbl. of bulk cement in less than 7 minutes. This is accomplished by the Airslide principle, a development licensed to Fruehauf by the Fuller Co. by means of which air is forced through a specially woven fabric to agitate the load and break through its normal angle of repose.

When the single panel unit is mounted in the Aerovan structure, it has a total overall length of 32 ft. The overall height

is 11 ft. 3 in. when mounted on 9:00 x 2000 tires. It weighs 11,400 lb. mounted on a Lube-Free tandem axle under-construction. A twin-panel Airslide bulk cement transporter has been also announced with the same basic principles as the single panel but in shorter length, permitting it to be built as either a semi-trailer or as a full trailer allowing operation either singly or as a train.

For more information circle 130 on Service Coupon Page 16 and mail now.

Wire for Tying Reinforcing Bars

Cal-Tie wire, a new product of the Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corporation, is now being manufactured at its Buffalo, N.Y. plant and will be marketed extensively throughout the Eastern United States. Manufactured by CF&I's Pacific Coast Division, Cal-Tie Wire has previously been available only in the West and in limited quantity in the East. It will now be marketed by CF&I's sales

offices located throughout the United States.

CF&I Cal-Tie Wire is stated to be achieving wide acceptance for tying reinforcing bars and numerous other tying jobs. The tie wire is packaged to assure greater safety, economy and efficiency, and is available with handy reel dispensers for use by both right and left-handed workers. The dispensers are attached with belt fittings, and leave workers' hands free for tying, carrying or holding without interference from tie wire coil.

For more information circle 131 on Service Coupon Page 16 and mail now.

Electric Impacttool

A new size 4U-SD electric Impacttool has been placed on the market by Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y. This new tool is designated as a standard duty model for applications where maximum power and speed is not required. The impact mechanism and all other construction features are similar to the recently announced heavy duty size 5U Impacttool.

Due to its lower power, the new 4U-SD Impacttool is both smaller and lighter in weight than the size 5U. However, like the size 5U, the new size 4U-SD Impacttool is a multi-purpose tool being readily adaptable to drilling, reaming, tapping, screw driving, wire brushing, etc.

For more information circle 132 on Service Coupon Page 16 and mail now.

For items on manufacturers literature see page 156



Nebel
LATHES
CINCINNATI

basic maintenance tool

Nebel extension bed gap lathes will turn all your maintenance jobs easily, quickly and inexpensively. The wide, deep gap accommodates outside, odd-shaped parts . . . and with the gap closed, you can do all your engine lathe work as well. Why buy two lathes when one Nebel will do? See Nebel gap and engine lathes at the Machine Tool Show, Chicago, Sept. 6-17 . . . or write for free bulletins, sizes 16"-50". The Nebel Machine Tool Co., Cincinnati 25, Ohio.

. . . for more details circle 245, page 16

down by the seashore

TATEM
Surf Club

Carefree living enhanced by . . . large, cheerful guest rooms . . . private pool, ocean beach, cabana club . . . dining room and cocktail lounge.

Rates from \$8 double,
European Plan.

SELECTED CLIENTELE

Write
for Booklet

On the Ocean
at 43rd Street





PLAN NEXT WINTER'S ICE and SNOW CONTROL *NOW!*

Prolonged confusion due to ice or snow is as unnecessary as it is costly. Proper planning *now* can avoid delays, duplication of work—and get streets or roads cleared *faster!*

That's why more and more highway officials order Sterling Rock Salt now, in August—and store it outdoors at key pick-up points, ready for instant use with the first storm.

Deployed storage puts rock salt where you

want it, when you need it—saves many man-hours when time is precious. Crews go right to work *spreading* salt—not hauling it over storm-choked highways.

And don't worry about storage losses. The free booklet, offered below, shows 11 ways Sterling Rock Salt can be stored easily, safely and economically, indoors or outdoors.

Action Now Saves Money!

Order Your **STERLING** AUGER-ACTION **ROCK SALT** *Today!*

**INTERNATIONAL
SALT COMPANY, INC.**
Scranton, Pa.

SALES OFFICES: Atlanta, Ga.
Chicago, Ill. • New Orleans, La.
Baltimore, Md. • Boston, Mass.
Detroit, Mich. • St. Louis, Mo.
Newark, N. J. • Buffalo, N. Y.
New York, N. Y. • Cincinnati, O.
Cleveland, O. • Philadelphia, Pa.
Pittsburgh, Pa. • Richmond, Va.

SEND FOR THIS FREE BOOKLET TODAY!

INTERNATIONAL SALT CO., INC., SCRANTON 2, PA.

Please send me the free booklet, "How To Provide Low-Cost Rock Salt Storage" (11 ways to store safely, economically—indoors or outdoors).

Name _____

Title _____

Address _____

City _____

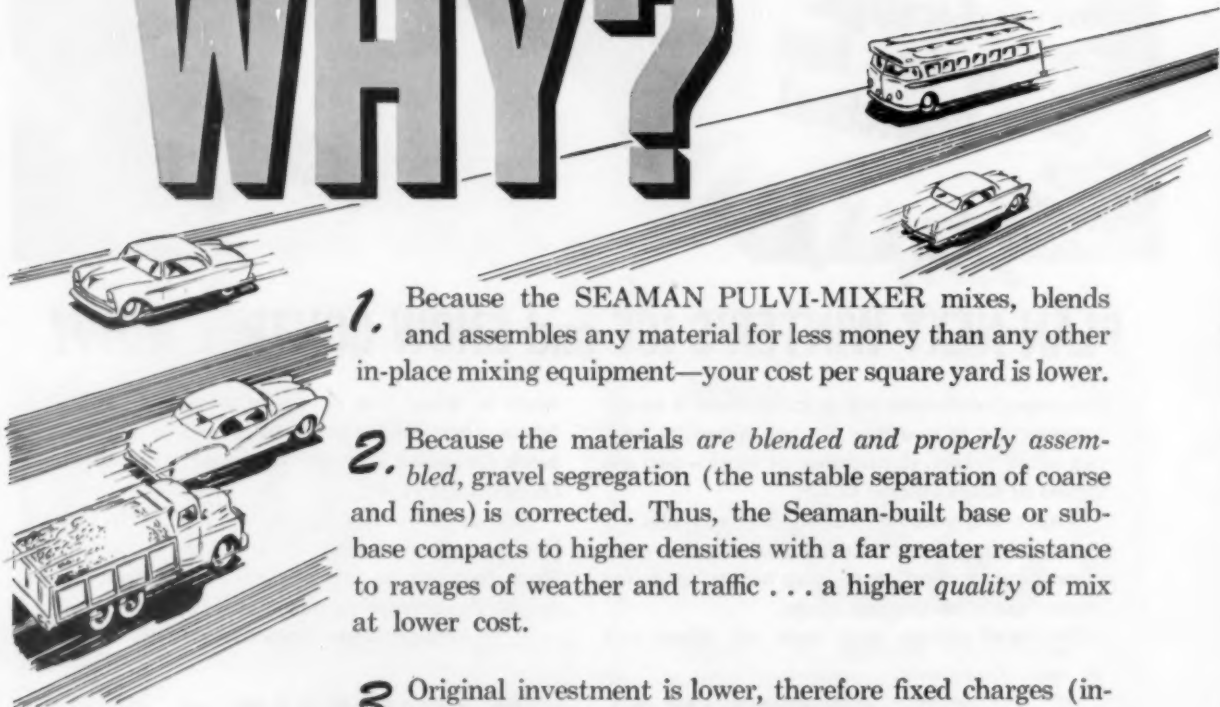
Zone _____ State _____

... for more details circle 204, page 16

ROADS AND STREETS, August, 1955

QUALITY ROADS built with the **SEAMAN PULVI-MIXER** Cost Less Than Poor Roads.

WHY?



1. Because the SEAMAN PULVI-MIXER mixes, blends and assembles any material for less money than any other in-place mixing equipment—your cost per square yard is lower.

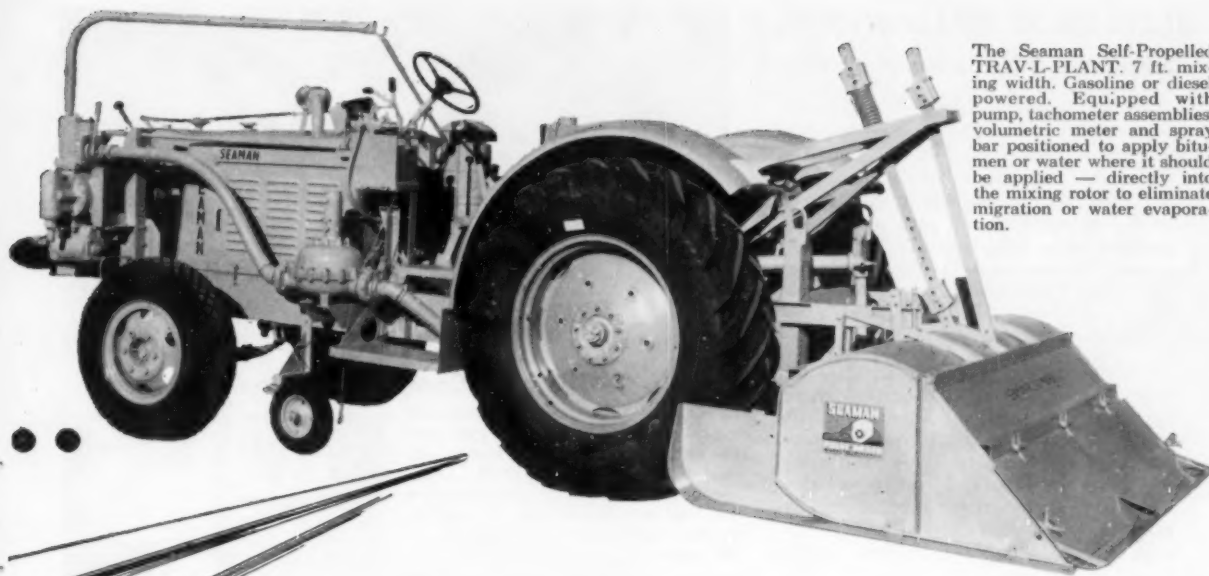
2. Because the materials *are blended and properly assembled*, gravel segregation (the unstable separation of coarse and fines) is corrected. Thus, the Seaman-built base or sub-base compacts to higher densities with a far greater resistance to ravages of weather and traffic . . . a higher *quality* of mix at lower cost.

3. Original investment is lower, therefore fixed charges (interest, depreciation, etc.) are substantially less.

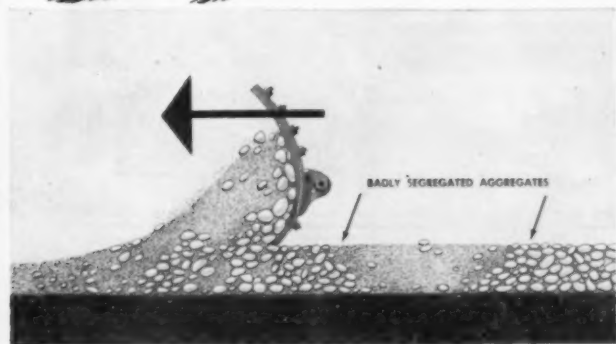
4. Savings in maintenance costs on Seaman-built roads are so substantial that those dollars can be channeled into new road programs.



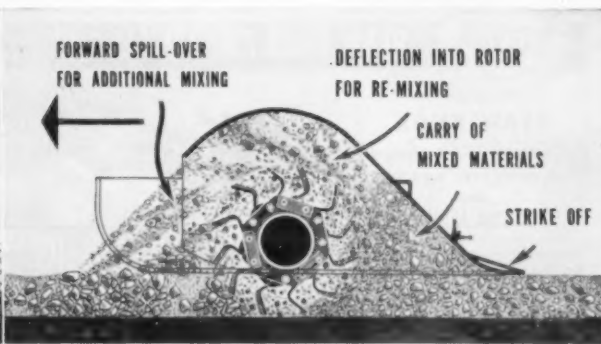
A comprehensive Seaman-Andwall Bulletin recently issued describes Seaman-mixing and Seaman equipment in interesting detail. Illustrates many field scenes and different types of stabilization. Send postcard today. Ask for Bulletin TPS.



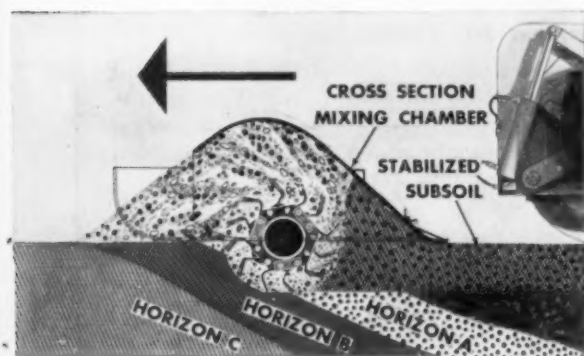
The Seaman Self-Propelled TRAV-L-PLANT. 7 ft. mixing width. Gasoline or diesel powered. Equipped with pump, tachometer assemblies, volumetric meter and spray bar positioned to apply bitumen or water where it should be applied — directly into the mixing rotor to eliminate migration or water evaporation.



When gravel is dumped on a roadway, larger stones fall first. Next come the fines. Thus alternate pockets of coarse and fine are formed. When these are bladed for mixing this segregation is made worse and the pavement will soon break up.



But when the Seaman Pulvi-Mixer is used, that unstable segregation (always present when aggregates are transported, moved or pushed) is perfectly blended and the materials are properly assembled so that the coarse stone is keyed and interlocked and the voids are filled with the fines. Thus the stone is securely mortared-in. A Seaman-built base or sub-base lasts for years.



Sub-grades have their own types of segregation for they consist of soils of varying characteristics and varying reactions to moisture. Only by blending these with the Seaman Pulvi-Mixer can uniformity in moisture, density and thickness be attained. And only then have you built a low cost SUB-BASE that reacts uniformly to weather and pounding traffic.



Here is a typical pavement failure due to two conditions: (1) an unstabilized sub-base that failed because of moisture permeation; (2) a segregated condition of the aggregates when the base course was inadequately mixed. Both these causes could have been prevented with the Seaman PULVI-MIXER.



Your Seaman-Andwall distributor has these cost and performance facts ready for your investigation. Call him now to get full advantage of the Seaman Pulvi-Mixer this season.

... for more details circle 244, page 16

SEAMAN-ANDWALL CORPORATION

291 N. 25TH ST. • MILWAUKEE, WISCONSIN

BLAW-KNOX ROAD WIDENER *Spreads 500 tons per day!*

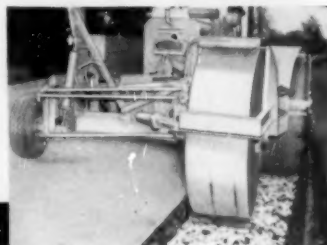
This job really rolled for D. E. Smith, Inc. of Mifflin, Pa. Their contract called for widening 3/4th of the stretch from 18' to 22', and the balance from 20' to 24', spreading 2" of fines in the bottom of a 3-ft. wide trench and, after compaction, spreading 10" of No. 4 crushed stone on top of the fines. *The Blaw-Knox Model 95 Road Widener, spreading 500 tons per day, widened approximately 3200' of highway every 10 hours!*

In addition to speeding operations, Blaw-Knox Road Wideners also lay concrete without forms, handle asphaltic concrete, dirt, gravel, stone or any kind of aggregate. They handle any widening job from 2' to 10' widths. They have many other time and money saving features your Blaw-Knox distributor will gladly explain. Call him today.



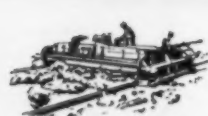
BLAW-KNOX Dual Compression Trench Rollers

Here's the most flexible and economical trench roller on the market! Width range can be accurately adjusted from a minimum of 20" to a maximum of 39", or any intermediate width. The two full-width, 60" high rolls, used either "dogleg" or tracking each other, are the equivalent of two separate rollers.

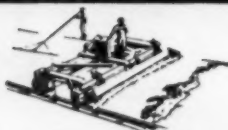


BLAW-KNOX COMPANY CONSTRUCTION EQUIPMENT DIVISION
PITTSBURGH 38, PA.

Ask about the
BLAW-KNOX
"Complete Package"
of CONCRETE PAVING
and
READY-MIX EQUIPMENT



CONCRETE SPREADER-VIBRATORS



FINISHING MACHINES



AGGREGATE BATCHING PLANTS



HI-BOY TRUCK MIXERS

... for more details circle 169, page 16

WHAT ABOUT YOU, MR. READER?

Are you still active in the field? Have you moved or changed your position?

Unless you send this information directly to us we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

Don't Let This Happen to You

Even if you think we know all about you, please fill in the information requested below and send to us by return mail. Our auditors require proof of accuracy of our mailing list. *You* are the only person who can help us on this. Do it now before you forget, so you can be sure your magazine will always be properly addressed to you. New names cannot be added or old names retained on our list unless we have *all* this information. *Please print or type.*

ROADS AND STREETS

22 WEST MAPLE STREET, CHICAGO 10, ILL.

DATE _____

- ☐ I do receive ROADS & STREETS and wish to continue to receive it.
☐ I do not receive ROADS & STREETS but would like to have it.

NAME _____

TITLE OR OCCUPATION _____

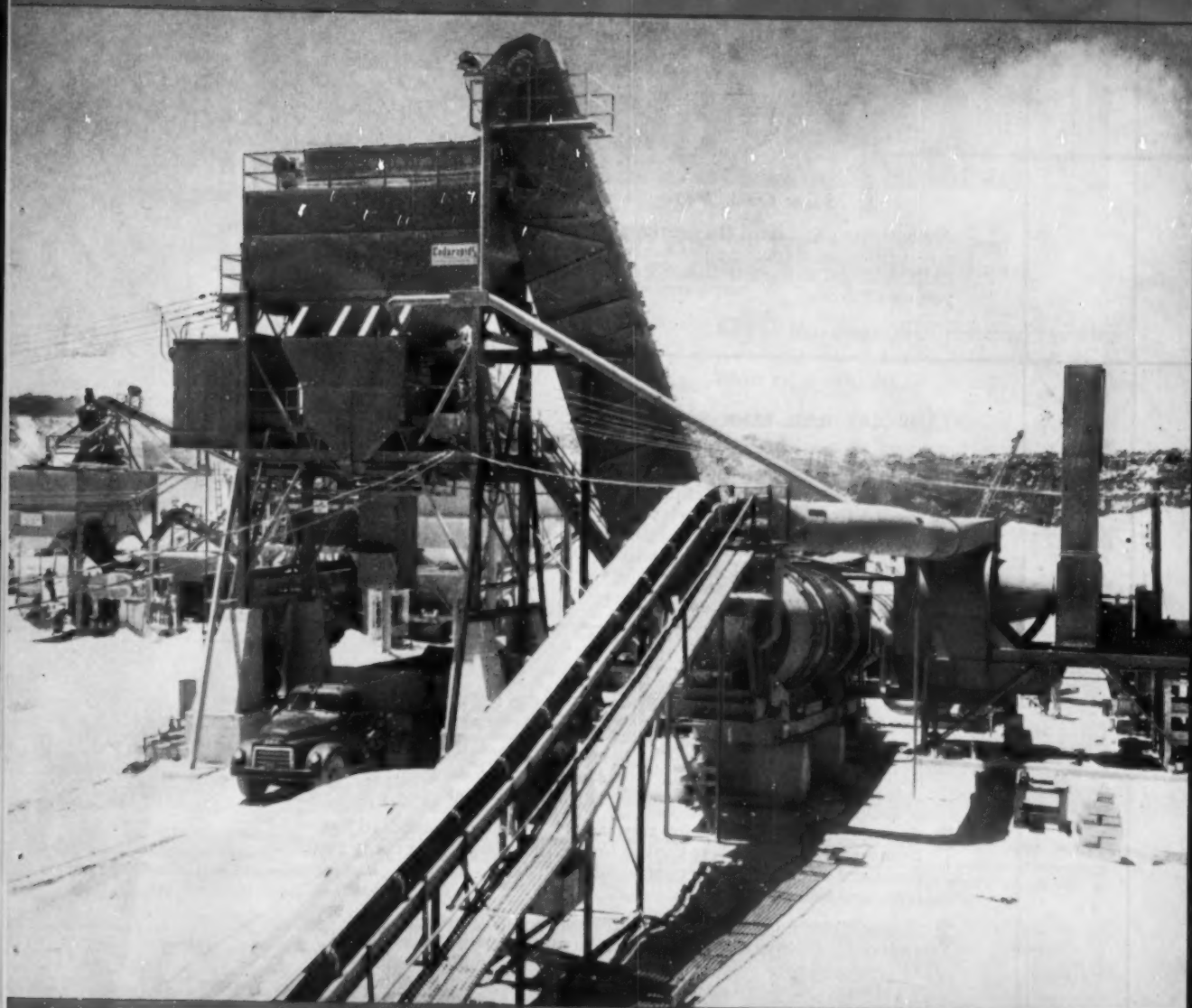
FIRM NAME OR GOVERNMENT DEPARTMENT (give street address) _____

CITY _____ ZONE (if any) _____ STATE _____
(If you have moved give old and new address)

SIGNATURE _____

Bituminous

ROADS AND STREETS



Published by ENR, Publishing Company
22 West Maple Street, Chicago 10, Illinois

Used to produce both hot and cold asphalt mixes, this plant is a Cedarapids with model G-602 mixing unit, model 5820-E drier and model DS-38 dust collector. McDonough Bros., contractors, Bexar County (San Antonio), Texas.

**Repaving Under Chicago's Heaviest Traffic
Patching Crews Patch 28% of the Time
Self-Propelled Air-Tired Roller
Paving Pennsylvania's Turnpike Median**

AUGUST 1955



Contractor's check list for specifying ASPHALT

1

CONVENIENT SHIPPING SOURCES

Standard has 5 centrally located shipping points in the Midwest:

→ Wood River, Ill.
Whiting, Ind.
Casper, Wyo.
Neodesha, Kans.
Sugar Creek, Mo.

Asphalt from Standard Oil gets shipped to you direct from the shipping point nearest your job site. Shipments get to the site faster, keep you on schedule.



2

TANK CAR AND TANK TRUCK SHIPMENTS

Shipments can be made from any Standard Oil shipping point in either tank car or tank truck. Standard Oil tank car service keeps contractors supplied with asphalt at the rail head as needed. Tank truck deliveries permit shipment directly to the job site, often saving heat-up to unload, and making possible unloading directly at the batching plant.

3

RELIABLE SOURCE OF SUPPLY

A reliable source of supply means three things to a contractor:

- 1** A supplier that delivers according to contract *when needed*. Standard Oil recognizes this as a prime factor in contracting for asphalt, delivering as the contractor needs material.
- 2** A supplier familiar with the contractor's problems. Standard has been supplying asphalt to contractors in the Midwest for many years. Standard salesmen know contractor's problems . . . know how to give him service.
- 3** A contractor must have dependable sources of supply. Taking care of its customers through periods of short supply as well as delivering when materials are plentiful is the kind of service contractors need, want and get from Standard. With the big program of road construction now under way and promises of even bigger programs to come, an assured, dependable source of asphalt is a must for every road building contractor.

Check this list, then check with Standard. In the Midwest contact your nearby Standard Oil office. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



STANDARD OIL COMPANY (Indiana)

DIG with the Model 705B to 4' deep up to 10½" wide. For toughest digging conditions. Travels at 15 m.p.h. Fluid drive. Vertical boom. Hydra-Crowd for infinite range of digging speeds between 0' and 16' per minute, independent of bucket line speed.



DIG

DIG at the lowest cost per foot of trench with a ditcher that's right for the job.

DIG in frozen ground, coral rock, asphalt pavement, virtually any kind of material.

DIG with a ditcher that saves you money on both manpower and maintenance.



DIG with the crawler-mounted Model 44C. For every kind of digging, to 8'-3" deep up to 24" wide. Vertical boom with power hoist. Self cleaning buckets. Automatic overload release trips on overload, automatically resets. Adjustable spoil conveyor.



DIG with the Model 711 to 5' deep up to 18" wide. For fast job to job travel, 45 m.p.h. road speed. Hydra-Crowd for infinite range of digging speeds between 0' and 16' per minute independent of bucket line speed. Operated from cab or ground.

WRITE for
INFORMATION

descriptive literature . . . sound movies

cost studies . . . nearby job inspection . . . plant layouts

Barber-Greene

AURORA, ILLINOIS, U.S.A.

CONVEYORS

LOADERS

DITCHERS

ASPHALT PAVING EQUIPMENT

BCG

. . . for more details circle 167, page 16
ROADS AND STREETS, August, 1955

McConnaughay ASPHALT MIXERS

HTD-B TRUCK MOUNT

... up to 5 tons hot mix, 10 tons cold mix per hour



HTD-500 ... up to 7 tons hot mix, 15 tons cold mix per hour



HTD-B ... up to 5 tons hot mix, 10 tons cold mix per hour



JR ... up to 60 tons cold mix per hour

... for resurfacing and patching in any season

Designed for economy of operation and fast production, the McConnaughay line of Asphalt Mixers meets every need for most resurfacing as well as all types of pavement patching. Working on location, McConnaughay HTD Mixers provide the exact amounts of materials needed and effectively remove both moisture and solvents from bituminous mixtures... positive assurance that patches and resurfaced areas will set up hard. For details and specifications on the mixers above and on the JR and HTD-LP models (not illustrated), write, wire or 'phone...

ASPHALT EQUIPMENT CO., INC.

3929 Buell Drive, Fort Wayne, Indiana

National distributors for

K. E. McConnaughay, Lafayette, Ind.

... for more details circle 253, page 16

Patching Crews Patch Only

28% Of the Time

Distribution of labor-hours of available working time on bituminous hand patching

Group	Percent of crew time	
	Average	Ranges
1. Actual work on the patch		
Prepare pavement	3	
Tacking	3	
Spread and smooth mix	20	
Roll patch	2	
Group total	28	15-48
2. Preparatory and incidental operations		
Travel between garage and work site	12	
Move to next patch or work site	9	
Traffic control	5	
Load and unload truck at yard or work site	6	
Obtain additional material	7	
Miscellaneous	6	
Group total	45	32-62
3. Waits and delays		
Waits during crew work	17	
Instructions and supervision	1	
Start late, excess lunch, quit early	2	
Idle, personal delays and resting	3	
Other	4	
Group total	27	13-44
Grand total	100	

SEVENTY-TWO percent of the work time of hand patching crews on bituminous road work was spent for preparatory and incidental operations, waits and delays.

This was the chief finding of job studies conducted by the Bureau of Public Roads on 24 locations in 14 states. The studies included over 1,000 man-hours of crew time, covering both hot and cold mix patches and spot sealing. Studies involving use of graders and other such major equipment were not included.

The table shows in summary form the average distribution of labor time in three principal groupings with sub-items for each group. The ranges (low and high) for each group are also shown. These ranges are arithmetic averages of the five lowest and five highest values observed.

Operations included under Group 2 are those generally essential to the performance of a day's work. They do

not, however, represent actual work in placing the patch. Some of the waits and delays included in Group 3 are, without doubt, unavoidable.

It is of interest to note that if it were possible to reduce the sum of Groups 2 and 3 by, say, 7 percentage points from 72 percent to 65 percent, the apparent effect would be to increase daily accomplishment (Group 1) by a fourth.

With the exception of those studies where motor graders were used (not included in this report), no significant differences were observed with respect to time distribution among the various groups, whether hot or cold mix patching or spot sealing. Daily accomplishment varied widely between the various types of patching operations. It also varied widely within each operation, even on successive days by the same crew.

Here tabulated are typical accomplishments, 4-man crew, 8-hour day.

Typical daily accomplishment of a four-man crew in an 8-hour work day

Type of patching operation
Placing cold mix patch, old pavement removed by hand
Placing cold mix patch, tacked, no old pavement removed
Not rolled
Rolled
Spot sealing

22 patches totaling 46 sq. yd., or
214 patches totaling 400 sq. yd., or
137 patches totaling 255 sq. yd., or
80 patches totaling 1,025 sq. yd.



● Find the paving equipment. The two asphalt pavers and the rollers are working a pair of inner north-bound lanes, while traffic is on mid-day pattern on Chicago's North Lake Shore Drive.

Repaving Under Chicago's Heaviest Traffic

How repairs and bituminous resurfacing were conducted with a minimum of traffic interference and without a single traffic mishap.

ONE of the world's busiest and fastest thoroughfares, Chicago's famed North Lake Shore Drive, has recently been repaired and repaved with a minimum disruption to traffic. Among the first limited access highways to be built in this country, the Drive was opened in the 30's.

According to Dick Fencil, Traffic Engineer for the Chicago Park District, present traffic volumes are as follows:

24-hour traffic flow — 120,000 to 140,000 vehicles.

Peak load (5:00-6:00 p.m.) — 12,000 vehicles per hour.

Maximum lane utilization — 1,600 vehicles per hour.

The work involved a 2½-mile section north from the Gold Coast, varying in width from 4 to 8 lanes. Miscellaneous repairs included stripping existing asphalt pavement, base repairs, adjustment of drainage castings and catch basins, certain new concrete base, and replacement of some curb

sections. Upon completion of repairs to this area totaling approximately 40,000 sq. yd. the roadway was paved with a 1½-in. asphaltic concrete top. The balance of the work required the leveling of low spots with binder and repaving of the four center lanes with 1½ in. (165 lb./sq. yd.) of asphaltic concrete on the existing 8-in. reinforced concrete pavement. This work involved 18,000 sq. yd. Prior to the application of binder and top, a prime coat of RC-O was required.

The contract was let in October, 1954, and completed in the 1955

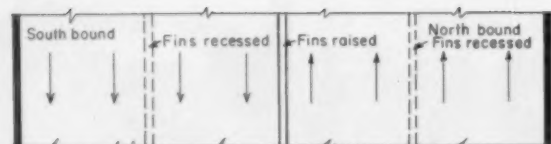
summer. Although late in the construction season the Park District engineers provided that as much repair as feasible be completed before the winter months. Most repairs were along the curb lanes. Prior to making base repairs and repaving, it was necessary to remove an overlay mat which had become worn and waved.

In scheduling this work the Chicago Park District engineers realized that too many restrictions placed on the contractor would considerably increase the cost of the project. The Traffic Division carefully worked out plans for handling normal and rush hour traffic, while providing the contractor a width of approximately 25 ft. in which to work at all times.

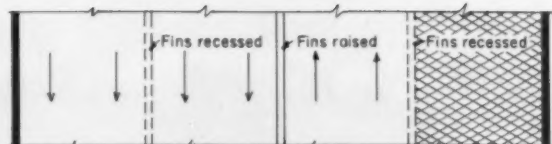
The 8 lanes are divided 4 north

● The resurface work as seen from a pedestrian bridge. Note the raisable curbs which can pair off the eight lanes to accommodate rush-hour commuter peaks.

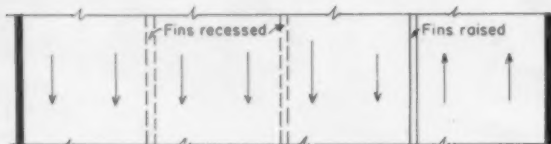




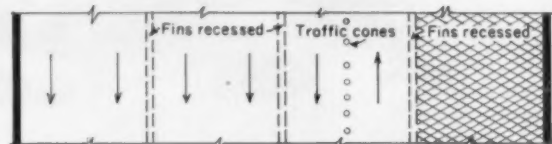
1-Normal traffic pattern between rush hours.



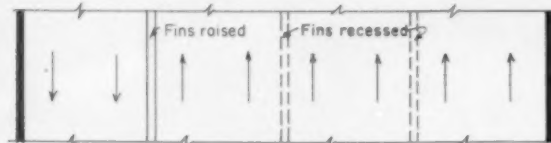
4-Normal traffic pattern between rush hours. Contractor working.



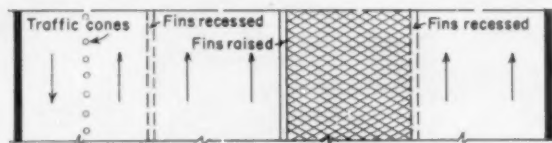
2-Morning rush hour pattern (in bound) 5:50 am. to 10:08 am.



5-Morning rush hour pattern (in bound). Contractor working in two east lanes.



3-Evening rush hour pattern (out bound) 3:35 pm. to 7:08 pm.



6-Evening rush hour pattern (out bound). Contractor working in two inner east lanes.

- Six different phases of traffic handling, normal and emergency, for Lake Shore Drive during resurfacing.

and 4 southbound, changing to 8-2 and 2-8 during morning and evening rush periods. (See Figures 1, 2 and 3). Lane changes in normal operation are accomplished by placing traffic signs and raising and lowering the special movable curbs for which the Drive is famous. These curbs, 8 in. high and 12 in. wide, are operated hydraulically. When lowered the fins become a part of the roadway surface.

The 25 ft. wide repair operation cut the Drive to 6 lanes through the work.

To facilitate the peak traffic movement, it was decided to use the 6 lanes on a 5-1 basis. (Figures 5 and 6). Lane utilization outside of rush periods varied from a 4-2 to a 3-3 ratio depending on which lanes the contractor was working in at the time. (Figure 4).

Traffic approaching the construction area was diverted by traffic cones and extensive signing. When neces-

sary to separate opposing traffic between lanes, where fins are not installed, traffic cones also were utilized.

The Chicago Park District after completing the traffic pattern for the construction area, provided in the special contract provisions that there would be no limit on the contractor's hours of work, with one exception. This exception provided that work in the outer lanes at the entrance to the on and off ramps at two overpasses should be done between the hours of 10 a.m. and 3:30 p.m., leaving these lanes open for at least one line of vehicular traffic during rush periods.

The time and effort of the traffic engineers in preparing traffic plan for the job have proved fully justified. The special provisions accompanying the bid proposals clearly set forth the areas in which the contractor would be permitted to work and delineated the responsibilities of the contractor with regard to signing and safety pre-

cautions. The responsibilities which the Chicago Park District assumed in connection with traffic control were also clearly set forth.

Unit bid prices were in line with prices bid for the same type of work on less heavily traveled streets. During periods of normal traffic there was little or no slowing down of vehicles due to work. During peak periods, traffic was slowed in the construction area; however, with one exception there was no increase in congestion. This traffic jam developed, not from construction activity, but from two cars becoming stalled on the single south bound lane during the evening rush hour. One north bound lane was temporarily opened to south bound traffic until the cars could be towed from the Drive.

Perfect Safety Record

Throughout the entire period in which the contractor worked on North Lake Shore Drive, not one accident chargeable to construction activity occurred in this area. No contractor equipment was involved in any traffic mishap. This is considered something of an achievement, since cars normally travel through this area at speeds of 40-45 mph. When accidents do occur on the Drive they are generally of the chain-reaction type involving several vehicles. Actually, the accident record on the Outer Drive is considerably below that of the local traffic streets: 2.4 per 100 million travel miles — for the last 5 years.

That there was little interference with the contractor's operation is indicated by the fact that the average day's run on asphaltic concrete was

- This sign serves both as a warning and as a source of good will. A similar sign tells when the driver has reached the far end of the work.



approximately 500 tons. The maximum for one day was 658 tons.

Equipment used in the repaving operation consisted of two Barber-Greene pavers, one Galion three-wheel roller, and two Galion tandem rollers. Completed work was reopened to traffic as each segment of paving was completed.

The asphaltic concrete top is a coarse grained mix with high anti-skid qualities. It is estimated by Park District engineers that this repaving will serve for at least ten years. A total of 1,022 tons of binder and 6,695 tons of surface course mix were laid. The in-place price of binder was \$11.75 per ton, and the top \$12.25 per ton. Total cost of the project, including repairs was \$140,000. The project was under the general direction of Robert A. Black, Chief Engineer, Chicago Park District. White Construction Co., Chicago, was the contractor and the project superintendent was Frank Armstrong.



● Bros pneumatic-tire, self-propelled roller at work on Minneapolis street project.

Self Propelled Air-Tired Roller Helps Densify Asphalt Paving

A PNEUMATIC-TIRED roller with all rear-wheel drive, recently introduced by Wm. Bros. Boiler & Manufacturing Company, is proving useful for compacting asphalt paving on Minneapolis streets.

Since the demise of trolley cars in the city of Minneapolis, an extensive street resurfacing program has been under way. Among the major projects being tackled by the engineering department is the laying of asphalt paving over several blocks of rough cobblestones and street car tracks having a good foundation.

The project includes placement of a 2½ to 3 in. binder course, laid over the comparatively rough cobblestones and tracks, followed by 1½ to 2 in. wearing course which is then sprayed with emulsified asphalt and covered with ¼-in. granite chips. The asphalt is laid at 300° F. and rolled by a 13-ton steel roller to cool it down. When it has cooled to approximately 200° F., a Bros Model SP 54 9-ton self-propelled pneumatic tire roller is put onto it.

The full oscillating action of every pair provides uniform pressure and equalized wheel loads, compacting

the material into the cracks and crevices of the cobblestones and around the tracks as well as the high spots. This results in over-all uniform compaction and elimination of surface voids. It also makes the roller especially efficient when rolling the feathered edges of new asphalt where it meets an old asphalt surface.

Seals Wearing Course

Following the re-rolling of the binder, the same procedure is followed on the wearing course. Carl Danielson, foreman of the asphalt paving crew, reports that the pneumatic tire roller seals the wearing surface better than the steel roller. He explains it by saying, "The kneading action of the rubber tires imbeds the coarse stony material, bringing the finer material to the surface. A few passes with the pneumatic roller and the difference is readily noticeable by a smoother, less porous surface. The ability of the pneumatic tire roller to provide uniform compaction over uneven surfaces, also makes it ideal for sealing the edges of the asphalt strips."

The Bros roller is used a third time on the seal coat for rolling the granite

chips. Here again advantages were reported for the pneumatic tires. There was no tendency to crush the chips.

Until recently pneumatic tired rollers have been of the towed type, with rolling accomplished in the forward direction only, necessitating turn-arounds after each pass.

With the advent of a self-propelled roller having fast shuttle or reversing gear, the turn-around problem has been eliminated, according to one observer. The self-propelled pneumatic tire roller would seem to have an advantage for operation on heavily traveled city streets and highways, where traffic is being maintained. The torque converter drive, providing smoother starts and stops, eliminates the possibility of tearing up the hot asphalt surface.

● The Asphalt Institute has created the first Bernard E. Gray Fellowship in Asphalt Technology at its host school, the University of Maryland. The Fellowship is named for the immediate past president of the Institute.

Asphalt Products Company's Model S-80 Simplicity asphalt plant, the fifth Simplicity plant bought by Dick Shorts of Youngstown, Ohio.

Note: Simplicity vertical asphalt tank at left and Simplicity 10' air washer at right.

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... for more details circle 224, page 16

VIEWS AND COMMENTS

By H. G. Nevitt

Design Methods Must Also Meet Standards

IN previous discussions we have indicated some doubts concerning bituminous surfacing design. We are not questioning that tremendous progress has been made in this field in the last decade or so, nor intimating that reasonably satisfactory designs according to present standards are not now being obtained by several approaches.

Our concern is instead towards the future. We believe design techniques acceptable with ordinary aggregates which, however, cause occasional trouble with unusual materials will not satisfy the needs of tomorrow. Likewise we do not think it merely sufficient to produce a surface which will not fail in the immediate future. Instead we need methods so exact that optimum economy, long life and minimum maintenance can be counted on rather than hoped for. Certainly present day methods do not positively assure these; nor can we at present estimate the quality increase due to any specific design change. But our main doubt is whether the approaches now in use will ever lead to this desired situation. To back up these remarks, some discussion of present design techniques is obviously in order.

• Since our questions generally concern fundamentals rather than the specific application of these design techniques, some preliminary consideration of design method requirements may clarify the situation. Perhaps the exposition will be considered elementary; but often it is advantageous to get down to elementals. Such review of an apparently satisfactory situation frequently brings out points which would otherwise be lost sight of.

Generally speaking, there are three basic design approaches. In actual practice they are likely to be intermingled, but all components of the technique must fall in one of these categories. Each of these approaches has its merits and its disadvantages. We will attempt to outline them as briefly as the magnitude of the subject will permit.

The first is to analyze the system, usually through mathematics, correlating thereby the desired characteristics

with simple known or tested properties of the materials used. As Lord Rayleigh has pointed out, no such assumed system exactly duplicates nature, which is far too complex. It may however be set up to so closely parallel the actual facts that the results deduced from the analysis can be applied with the degree of accuracy needed. But this latter point must be established. It can be done through a logical analysis of the differences and their possible effects, demonstrating these are not material; or it can be proved through tests which unquestionably justify this conclusion.

The second approach is to duplicate the proposed system, such as through a model, and then by suitable tests determine that it meets the required needs. The basic requirements with this method are to prove that the system really duplicates the one to be built and that the tests applied subject it to exactly the same type of stresses which will be encountered by the actual system in use.

The third approach is resorted to where neither of the foregoing is found applicable. In it the conclusion is reached that the quality of a system is correlated with certain properties of the material used in it or of some duplicated portion of it. The correlation may have considerable reasonableness, but it is still empirical. It should be noted that it must be complete as well as exact; the two are not the same, with the former the more difficult to demonstrate. With the correlation so determined, it can be applied to further construction. It is obviously a round-about attack, but often the only one available for complex systems which have so far defied analysis by the other approaches.

• The merits of these three methods of analysis and design, likewise their disadvantages, are quite distinct and should be well understood. In the first (or so-called rational approach) the results are extremely satisfactory provided the required analysis is feasible, and likewise the tests to prove that the assumed system does duplicate nature to the required degree can be made. Evidently almost any question

about a system which can be completely analyzed can be answered.

Another advantage is that the material tests involved are generally so simple and of such a fundamental nature that the procedure is very satisfactory from the practical standpoint.

• There are two appreciable drawbacks to the use of this method. The first is that too many systems are not susceptible to analysis without unwarranted simplifying assumptions. The second is that the tests to prove the acceptability of the system as a duplicate of nature are either difficult or impossible. This makes the analytical results more dependent upon wishful thinking that the assumed system provides for the variables encountered than any undisputable demonstration that such is the case.

The merit of the second approach is that it is in principle applicable to any system regardless of its complexities, number of variables or other features which make theoretical analysis impracticable. No comment is needed here on the great success attained through the use of test models in many difficult lines of engineering. The great objection to it is the difficulty of demonstrating clearly that the basic criteria implied in the approach are met. In many lines of work it is almost impossible to provide assurance that the model does duplicate the actual structure in all its aspects. It is equally difficult to make certain that the conditions and stresses to which the actual structure will be exposed are being exactly duplicated in the test procedures to which the model is subjected.

• The benefit of the third approach is obvious. Certain simple and easily tested properties, if they do correlate with the performance of the finished structure, can then be set up as criteria. The disadvantages of the method are equally great. One is the difficulty of determining the criteria which indicate the operation of a structure in practice. The other is the unreliability inherent in the method almost regardless of the satisfactory results obtained from it in the past. A very

elementary example may give some hint as to this last situation.

In our western states a common method of roughly counting a herd of sheep is to take a count of the number of black sheep in the flock. It has been the practice to hold the percentage of these black sheep to the white sheep to a constant ratio of roughly one black sheep out of each one hundred total sheep in the flock. Once this ratio has been set up, it tends to be maintained by nature; its obvious merits in checking flocks numbering into the thousands need not be discussed. However, it is an arbitrary practice. Just what would you do if you were completely dependent upon this method of counting when you encountered a flock in which for one of several reasons there were no black sheep at all?

The assumed method would indicate there were no sheep there whatever. Without it, you would have no way of knowing how to estimate the flock. Furthermore, it is always possible that you will encounter a flock whose owner will not care for the method and maintain the ratio regardless of its wide usage; but you have no way of knowing when this is the case. This example of course brings in human motivation along with natural forces. But it is still true that where effect alone is being considered, without its linkage to cause being completely known, there is danger of some factor not previously active vitiating the final result. In brief, arbitrary correlations, no matter how frequently observed and arguable as having logic, can never be relied upon to cover all new situations.

As previously commented these general methods of design are often intermingled, so that the classification of any particular technique is not quite as simple as the above discussion might indicate. However, the fundamental requirements or tests which should be applied to the technique to determine its suitability can easily be deduced. They usually sum up into one or more of the following questions: Does the analytical procedure depend upon assumptions which cannot be conclusively demonstrated, no matter how plausible they may appear? Do the test methods apply stresses to the system or material in exactly the fashion that they will be encountered in practice? Does the model or specimen tested exactly duplicate that which will be constructed? There are other points to consider but usually these primary questions will quickly bring out the merits of any design method.

● We believe the interested reader will be quite intrigued if he will ana-

lyze the present methods of bituminous design to determine just which of the above approaches is used, and how well the criteria which indicate the suitability of the approach have been demonstrated as being met in the technique. We suspect he will have many questions. He may find answers to them, but not in the usually encountered descriptions of the tests or implied in the technique procedure. We plan to make some comments along these lines in a later issue; meanwhile, we think that a critical review of our bituminous design procedures from the standpoint of fundamental engineering philosophy will be quite rewarding to those responsible for the future in this field.

Asphalt Institute Board okays research program

An intensified research and development program, with emphasis on improved asphalt mix designs, was approved by the board of directors of The Asphalt Institute at its semi-annual meeting in Colorado Springs, June 22-23.

Top priority was assigned to the mix design studies in anticipation of an almost certain record boom in highway construction in the next few years.

The approved laboratory program for the Institute also will concentrate itself on four other high priority subjects. These include the use of asphalt in soil stabilization, thickness design for flexible pavements, airfield paving

for the jet age, and the use of asphalt in hydraulic engineering.

Slag tonnage reported for highway work

The use of air-cooled blast furnace slag, sold or used by processors in the U. S. in 1954, is reported by the Mineral Industry Surveys, U. S. Bureau of Mines. Total of 2,431,000 short tons was used in portland cement concrete construction; 5,511,000 tons in bituminous construction (all types); 9,100,000 tons in highway and airport construction, other than the foregoing. These figures are for screened slag except for 500,000 tons in highway and airport categories of unscreened material.

Also a total of 1,384,000 tons of granulated and expanded blast furnace slag was reported as having been used for road fills and related work during 1954.

German road chief tells of Reich program

West Germany has embarked on its own gigantic highway construction program aimed at doubling the size of its present 1,800-mile autobahn system in the next two decades.

This was disclosed to U. S. engineers recently by Dr. Herman Kunde, minister of roads for the Bonn government, while in the United States. Dr. Kunde said the first phase of the program is expected to add some 600 miles of new construction in the next five years.



● West Germany highway experts during an inspection tour of the Asphalt Institute's new laboratories in Maryland. Engineer of Research John M. Griffith describes one of the industrial ovens as President J. E. Buchanan (rear) looks on. The Germans include Siegfried Giesa, German traffic engineer now studying at Yale; Heintz Werner Oberbach, son of the Reich's leading highway and airfield contractor; Dr. J. Oberbach, and Dr. Herman Kunde, minister of roads in the Bonn government.



- A section of completed medial paving, showing centerline "crease," made by an edge of the roller. The crease in the middle foreground leads downhill toward the camera, into a catch basin inlet for drainage.

Paving Pennsylvania Turnpike Median

DURING 1954, work was completed on the paving of the medial strip between roadways on a short section of the Pennsylvania Turnpike, between mile post 98.7 and 99.6.

This section, at a rather high altitude and subject to the worst climatic conditions of any part of the turnpike, suffered from considerable erosion due to the gradient. Heavy maintenance was required to keep the granular surface in good repair.

The design of the turnpike's median, by the way, is for slightly depressed cross-section under certain circumstances under which water is gathered into catch basin inlets. In other parts, the median drains across the pavement in either direction.



- Material was loaded into a Walter truck for disposal.

- (Left): Athey loader picking up the loosened material which had been rooted to a depth of 10 in. Truck in inner lane used to divert traffic to outer lane protected by sign (not shown). (Right): Photos taken at a later date show surfacing operation on the medial strip. At this location a surface treatment with rolled crushed stone cover was applied. Again note sign on pavement reading "Single Lane Traffic," to protect motorists and maintenance workers.





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Dehydro is an effective complex organic semi-polar chemical which is firmly adsorbed at the asphalt-aggregate interface, insuring a permanent, tenacious bond. This bond is extremely stable, greatly extending the service life of asphaltic road surfacing by preventing stripping and water encroachment.

The Dehydro interfacial bond is immediately effective on contact. The adsorbed film is formed even in the presence of free water, causing the aggregate to become oil-wettable. Aggregate is easily coated without a time-consuming drying step—in fact, gravel freshly removed from a river bottom can be coated without difficulty.



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DEHYDRO



WITHOUT
DEHYDRO

Photos show how Dehydro oil-wets stone in the presence of water to facilitate coating. The containers were partly-filled with water, upon which a layer of asphalt was floated. A silica slide was water-wetted and immersed through the asphalt into the water.

The slide immersed through the asphalt without additive (right-hand photo) was not coated. In the left-hand photo, where 1% Dehydro was added, the slide was coated on contact. Note the lower meniscus of the asphalt layer in the left-hand container—the Dehydro permits the asphalt to wet and adhere to the container wall, whereas in the right-hand container, the asphalt tends not to adhere to the water-wetted surface.

For complete information on Dehydro additives, write or call

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● (Left) Austin-Western 99 H motor grader with ripper teeth, loosening the existing granular material, preparatory to removal. Sign on pavement reads "Single Lane Traffic." (Right): Final rolling of a ditch section of medial; catch basin again shown in foreground.

The work pictured consisted of removing the spongy material during the spring months, down to a depth of 10-in. below the top of the pavement. Tile underdrain was installed and the strip built up with coarse aggregate for the first 8 in. of depth, then followed with 2 in. top course of asphaltic concrete. This work has stabilized the medial strip and afforded an excellent drain for melting snow and ice during the winter months. The work was performed by the maintenance forces of the Pennsylvania Turnpike Commission.

Contractor association comments on bid rejections

When contractors bid 20 percent or 30 percent under the engineers' estimate, over a period of months, it is only natural that the engineers should revise their estimates downward. Then when prices start to rise interesting things happen.

On this subject, the following comment was published by the Virginia Road Builders Association recently for its members.

"Attached to this bulletin is a list of awards and rejections covering the projects on which bids were received June 15. Three projects were rejected by the Department. This means that the contractor's bid exceeded the engineer's estimate by more than 10 percent. All three rejected bids were low-dollar-wise and the maximum varia-

... for more details circle 236, page 16



● Ready to go into an Airforce C-119, this Barber-Greene "Mixall" was loaded at Chicago's O'Hare Airforce Base and flown to Moody AFB in Georgia for an emergency job.

Asphalt unit airlifted

A combination dryer-mixer for producing bituminous maintenance and patch mixes (a Barber-Greene Mixall) was recently airlifted in an Air Force C-119 "Flying Boxcar" from O'Hare Airforce Base near Chicago. The first destination of the equipment was Moody Airforce Base near Valdosta, Georgia where an emergency maintenance problem made it's early delivery imperative.

Although the 6,800-lb. machine

tion was \$3,500 on the largest project.

"It is normal for the engineers to seek to follow the price trends established by contractor's bids, and we are bound to face a number of rejections when prices start to rise. The bids on June 15 were about 10 percent below the estimates as an average, which does not show any real improvement over past months. However, on the construction projects the number of bids averaged 3.7 for each one. This is low in comparison to the 6.7 per project reported by the Bureau of Public Roads.

"We also report to you that two contractors are experiencing difficulty and may be forced out of business as the result of bids which were too low. There may be more for there is little you can do to raise the income on a project after you have set the prices."

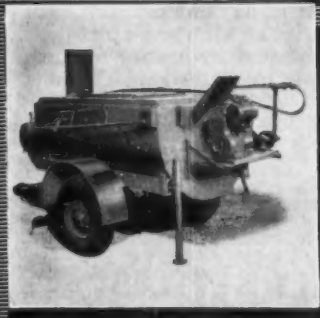
● An electric eye which automatically checks the height of all trucks passing a given point has been installed by the Pennsylvania Turnpike at its Philadelphia interchange. A bell sounds whenever a truck passes which is over the height limits allowed by the turnpike for safe clearance of its tunnels and bridges. The device was developed by Taller, etc. Cooper, Inc.

had been towed from the factory to O'Hare Field, some 40 miles, it was necessary to reload it onto a flat-bed trailer for transfer into the aircraft. The trailer proved to be some five inches higher than the floor of the plane. However, this difficulty was quickly overcome by reducing the pressure in the Mixall's tires, thus lowering its over-all height and permitting loading.

After its service at Moody Airforce Base is concluded, the unit is scheduled for use by the Crew Training Branch at Randolph Airforce Base, at San Antonio, Texas.

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PATCH AND MOVE ON IN MINUTES AND SECONDS

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That's a photo of Francis Willette of the Willette Excavating Co. blacktopping the 8300 sq. yd. parking lot of the Dunwoody Institute in Minneapolis. His Rosco MODEL RHU MAINTENANCE DISTRIBUTOR is making money on every job. Quick to start and get going, the RHU is designed for economical bituminous maintenance and limited construction. It has many of the features required by contractors . . . as well as municipalities. For driveways, alleys, streets, parking lots, shoulders, re-shaping curves, patching, sealing and a host of other jobs . . . Model RHU will get YOU "into the profit picture". Check the money-making features with your Rosco dealer. He'll show you what Model RHU can do for you. 800 to 1000 gallon capacity.



2-Wheel Model RMT Maintenance Unit with front mounted heaters and rear mounted pump and engine is available in 400, 500 or 600 gallon sizes.

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Used by contractors, highway departments, roofers and waterproofers for heating and melting all types of bituminous materials. Two-pass heating system, ruggedly built. Capacity 2, 3 or 4 barrels.



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. . . for more details circle 221, page 16

New Publications

Bituminous paving mixtures—fundamentals

Bulletin 10S, Highway Research Board, 2101 Constitution Ave., Washington, D. C. No. 9. Discusses fundamentals governing the design of bituminous paving mixtures. The essential properties required are defined and procedures are discussed for designing to meet these requirements.

The uses and types of bituminous mixtures are related to some of their properties. The effects of variations in characteristics and gradations of aggregates and the effects of variation in bitumen content and characteristics of bitumen on the physical properties of mixtures are discussed at length. Practice in designing these mixtures and references are listed.

Eight appendices are also included which describe applicable methods of tests of mixtures, mixture components, and of surfaces. Price 75 cents, remitted to above address.

How to prepare an annual public works report

THE ANNUAL PUBLIC WORKS REPORT. Special Report No. 19, American Public Works Association, 1313 East 60th Street, Chicago 37, Illinois. Price \$1.00.

This outline is a check list, prepared as a special report by the Wisconsin Chapter of the APWA, under John E. Dever, City Manager of Two Rivers, Wisconsin, as Chairman. The publication makes recommendations on such topics as who should receive the report, how extensive it should be, and how detailed, its objective, how objective should be accomplished, when to secure outside help in its preparation.

ROADSIDE DEVELOPMENT, 1955. Published by the Committee on Roadside Development of the Highway Research Board, this 62-page report comprises eight papers given at the 34th Annual Meeting of the Board, January, 1955. It contains a great deal of valuable data by leading authorities on erosion control, seeding and mulching with emulsified asphalt, fertilizing and seeding with compressed air, slope stabilization, mowing and herbicides, chemical weed control, and roadside noise and dust reduction.

Available at price 90c. Address Highway Research Board, 2101 Constitution Avenue, Washington, D. C.

Bitumuls Black Seal puts new life in city streets



Bitumuls Black Seal, consisting of a single application of Bitumuls emulsified asphalt, puts new life in weathered pavement surfaces.

Merced, California, treats 140,000 square yards at cost of \$1050

A recent survey of residential streets in one section of Merced, California, indicated that the paved surfaces were starting to deteriorate at an alarming rate. Some were streets originally built of concrete and later resurfaced with a one-inch asphalt plant-mix overlay. Others were plant-mix surfacing on a rock base.

For those surfaces that were seriously cracked, broken or ravelled, specifications were drawn up calling for Bitumuls® Surface Treatments (either Single or Double, with chip-cover).

Preventive Maintenance Indicated

On many of the streets, however, the surfaces while still in relatively good condition were oxidized, dry and open-textured. The Engineers realized that unless some form of "preventive maintenance" were undertaken, these surfaces would soon require extensive repairs and possibly complete resurfacing. What they needed was a method of revitalizing these surfaces, plus the placement of additional binder to seal the interstices against water damage.

Bitumuls Black Seal Selected

After investigating several proposed methods, the Engineers decided on the use of Bitumuls Black Seal to rectify the situation. For this work 0.1 gal. per sq. yd. of (1:1) diluted Bitumuls

SS-2 emulsified asphalt was applied to the surfaces. No cover was used. This treatment provided the necessary binder to adequately seal the pavement, and the coating was thin enough on the high spots to prevent pick-up under traffic which was allowed over the pavement within one hour.

Adaptable To Wide Application

Costs of the Black Seal work and for the other Bitumuls Surface Treatments are given in the table below.

Dry and open-textured paved surfaces are not peculiar to Merced. This method of economically extending pavement life merits investigation by communities in every part of the country. *Specifications on Black Seal, and on Bitumuls Surface Treatments, are available on request.*



Engineers of Merced and Fresno, California, inspect pavement to be revitalized.



Before. Here is a representative dry, weathered surface for which Engineers of the City of Merced recommended Bitumuls Black Seal.



After. Notice the tight, uniform texture obtained by a single Black Seal application. No tendency toward fatness or bleeding.

COST SUMMARY

ITEM	I Black Seal	II Single Chip Seal with Black Seal	III Double Chip Seal with Black Seal
Labor (including Rock Haul)	\$210	\$168	\$602
Bitumuls RS-1 at 10c per gal.		160	829
Bitumuls SS-2 at 11c per gal.	840	90	396
1/2" Crushed Rock at \$2.35 per ton		151	668
3/4" Crushed Rock at \$2.35 per ton			450
1/4" Crushed Rock at \$3.35 per ton			
Total Cost (labor & materials)	\$1050	\$569	\$2945
Total Square Yards	140,000	6240	16,090
Cost per square yard (labor & materials)	\$0.0075	\$0.0913	\$0.183

Note: Cost does not include equipment rental.

**AMERICAN
Bitumuls & Asphalt
COMPANY**

200 BUSH STREET • SAN FRANCISCO 4, CALIFORNIA

... for more details circle 163, page 16

ROADS AND STREETS, August, 1955

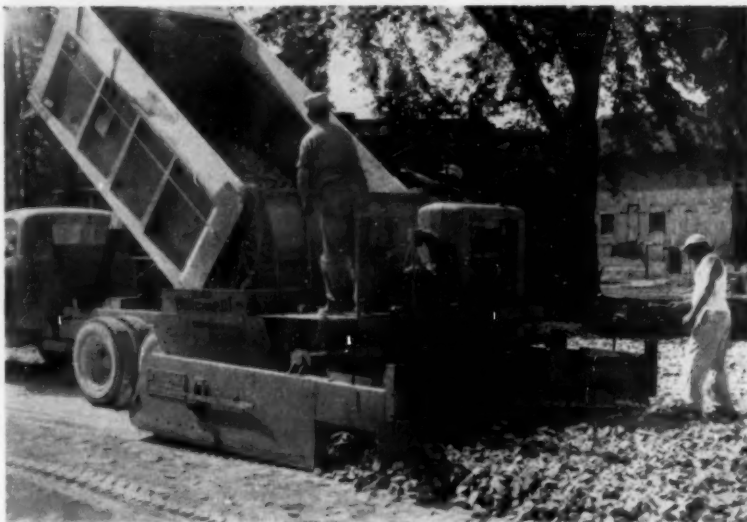
E. Providence 14, R. I. Perth Amboy, N. J. Baltimore 3, Md. Mobile, Ala.
Cincinnati 38, Ohio Columbus 15, Ohio Tucson, Ariz. Seattle, Wash.
Baton Rouge 2, La. St. Louis 17, Mo. Inglewood, Calif. Oakland 1, Calif.
Portland 7, Ore. Washington 5, D. C. San Juan 23, P. R.

Bonds Finance Well-Paved Parking Lot

City of Bellevue, Ohio, builds 101-car lot, equipped with multiple-coin-type 10-hour meters. A project built by contract to insure good quality paving at low cost.

THE new off-street parking facility which is expected to do so much to relieve the parking problem at Bellevue, Ohio, will not be one of the mud and dust and loose stone type of lots, but a modern well-paved one.

The lot was financed by a revenue bond issue of \$85,000, a revenue issue without city obligation. The bonds are to be retired through the proceeds of parking meter collections. A total of 101 meters of the multiple-coin-type were installed. The plan is to charge 5 cents for 2 hours, 10 cents for 4 hours and 25 cents for 10 hours, the meter having a 10-hour dial.



● A 6-in. waterbound macadam base insures good stability to the lot pavement.

PARKING LOT Planning and Construction

One of a Series

The 165 ft. x 265 ft. lot is located on a corner, one block offside from the main business street, which is traversed by heavy through arterial highway traffic on U.S. 20 and other intercity routes. The layout of parking consists of four rows of stalls with two passageways as shown on the accompanying plan.

The work on the parking lot was sub-divided into four contracts: Contract A consisted of the demolition of the existing dwelling on the site, held by Scagnetti Construction Co., of Bellevue, Ohio, at \$1,612.

Contract B was for removal and disposal of 27 trees and stumps 12 in. or larger in diameter; held by Elmer Borchardt, Inc., Castalia, Ohio; \$945.

Contract C was for grading and paving the area, also held by Elmer Borchardt, Inc.; \$18,416.

Contract D consisted of the erection of lighting facilities; held by Cliff Reitz, Bellevue, Ohio, at \$2,541.

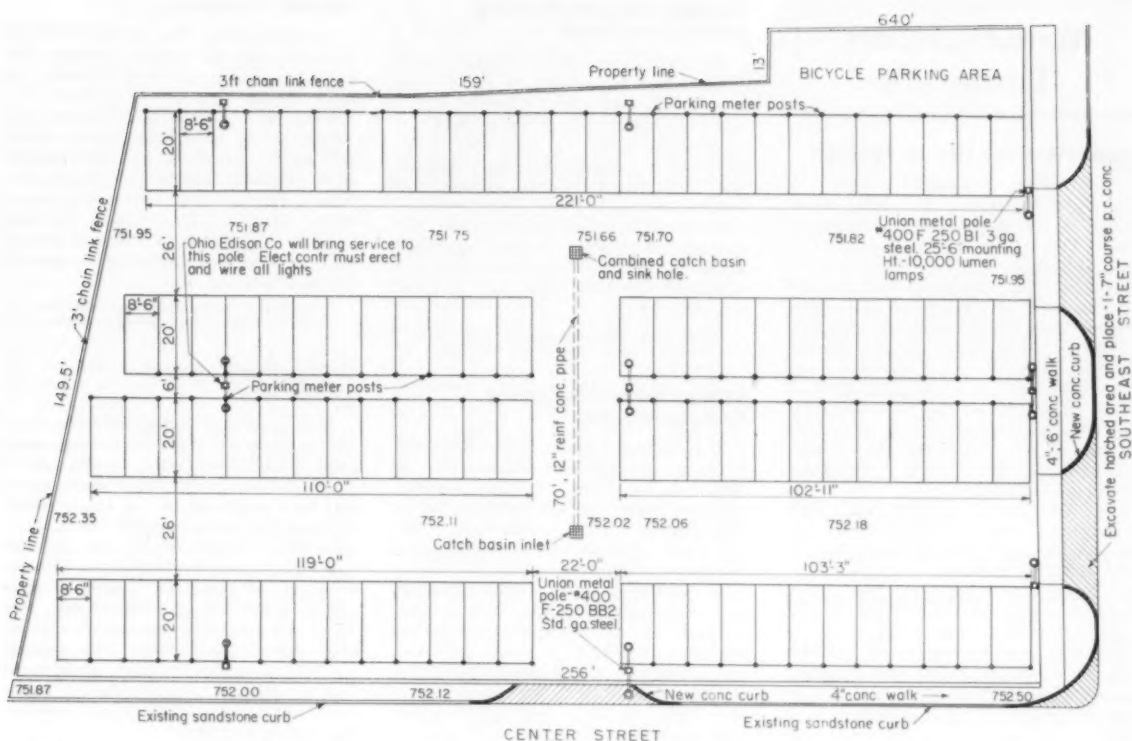
The contract for furnishing and installing parking meters was held by the Park-O-Meter Co., Oklahoma City, Okla., at \$5,973.

Contract C, the principal contract, was awarded February 23, 1955. The chief quantities were as follows:

Earth excavation — 2,300 cu. yd.

- The new lot began to receive patronage by store customers from the day of opening.





● Details of parking lot, showing location of stalls, meters, light poles, drainage features and curb and walk reconstruction.

Limestone screening insulation — 205 tons.
 Waterbound macadam base — 1,333 tons.
 Bituminous prime coat — 1,050 gal.
 Hot-mix, hot-laid asphalt concrete surface — 512 tons.
 4-in. concrete sidewalk — 1,636 sq. ft.
 5½-in. concrete sidewalk — 366 sq. ft.
 Parking meter posts in place — 101 each
 Concrete bases for light standards — 9 each
 Removal of existing sandstone curb — 215 lin. ft.
 Construction of circular concrete curb — 102 lin. ft.
 Construction of straight concrete curb — 32 lin. ft.

12-in. reinforced concrete pipe — 70 lin. ft.
 3-ft. chain link fencing — 372 lin. ft.
 Limestone screening fill for basement of old house — 386 tons
 7-in. Portland cement concrete — 1,175 sq. ft.
 The paving cross section consists of a 1-in. insulation course of limestone screening placed on earth subgrade; a 6-in. course of waterbound macadam base which after laid was primed with MCI; and a 2-in. surface course of hot-mix, hot-laid asphaltic concrete. The Ohio Road Improvement Co., of Columbus, Ohio, was sub-contractor for Elmer Borchardt on furnishing and laying the hot-mix surface.

The lighting of the lot is accomplished by means of nine standards accommodating 13 lights. The standards were by Union Metal Pole Company. The luminaires are Westinghouse AK10 I.E.S. Type 3,10,000 lumen lamps. The mounting height of the luminaires is 25½ ft. above the pavement surface. The lights are actuated by means of an astronomic time clock, set to turn on the lights each evening one-half hour after sunset, and with the cut-off time being presently established at 11 p.m.

The lot was designed and built under the supervision of Kenneth A. Polta, Service Director, City of Bellevue.

● Elmer Borchardt put modern equipment on the job just as on any highway or street project.



Manufacturers' Literature

Equipment for Use in Paving

Four folders are available from The Cleveland Formgrader Co., Miles Road, Avon, O., on its line of paving equipment. One folder covers trail graders, and push planes which are illustrated and described. The Cleveland form tamper is illustrated and described in another folder. This form tamper is one man operated and is stated to perform the tamping with one third less settlement than with hand tamped forms. A third folder is devoted to the Cleveland aluminum straight edges. The fourth folder features the Cleveland form grader. Specifications and illustrations of the grader in operation are given.

The form grader cuts the trench with a revolving cutter. The cutter is adjustable up and down by the operator who rides the machine. A gauge at the side bears against the grade line with a hair-spring pressure. The cutter blades cut exactly 24 in. below the mark on this gauge. The cutting speeds are 9½ and 19 ft. per minute for normal operation. Other speeds of 2½ and 5 ft. per minute are available for extra hard cutting.

For more information circle 133 on Service Coupon Page 16 and mail now.

Catalog Features Hauling Unit Rating Chart

A new 4-page catalog describing the features and advantages of the all-purpose C & D wagon for Caterpillar DW20 and DW21 tractors is available from C & D Manufacturing Co., Perkins, Calif. Featured is a comparison chart showing how scrapers, side, bottom and end-dump wagons rate again the 11 "most wanted" features of the ideal hauling unit. Advantages of positive ejection, controlled dump and spread on rock mud, dirt and aggregate handling jobs are pictured and described.

For more information circle 134 on Service Coupon Page 16 and mail now.

Expansion Joints, Curing Compounds, Etc.

A new catalog on its Sealtight Paving Products is available from W. R. Meadows, Inc. Dept. PP, Elgin, Ill. The products include asphalt expansion joints, fibre expansion joints, center strip, dummy joints, concrete curing compounds, subgrade paper, base plate, rubber asphalt joint seal, sewer joint compounds and road marking paints. This catalog not only contains all of the general information on each product (physical properties, sizes and thicknesses, installation information, etc.), but also a section that truly explains what specifications each product meets.

For more information circle 135 on Service Coupon Page 16 and mail now.

Electric Vibrators

A new catalog, No. 11, describing its complete line of electric vibrators has been released by Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland 13, O. This catalog, which gives specifications and prices, covers Cleveland's silent, eccentric weight vibrators, and electro-magnetic vibrators. Information is also furnished for vibrating tables, and pneumatic vibrators. The catalog furnishes graphic illustrations of vibrators in action, as well as information on mounting and installation.

For more information circle 136 on Service Coupon Page 16 and mail now.

Bridge Decking and Drain Gates

A 16-page data and specification manual covering all types of grating, open steel floor armor, stair treads, vessel liners, bridge decking and drain grates has been published by the Klemp Metal Grating Corporation, 6605 South Melvina Ave., Chicago 38, Ill. The publication contains safe load tables for all basic types of gratings, panel width constant charts, tables on standard widths and types of steel stair treads most frequently used, types of anchors used for grating, use of grating and its allied products in industry and the oil and chemical fields, tables on bridge decking and various types of drain grates.

For more information circle 137 on Service Coupon Page 16 and mail now.

NEW Littleford-Clarkmoore Asphalt Road Heater-Planer Heats and Planes in one continuous operation!

engineered unit for
heating and planing
bituminous roads,
streets and
runways

No other unit like it! This ingenious new machine—with one man at the controls, and in one continuous operation—heats and planes off high crowns, corrugations, eliminates troughs and ruts. Performs these and many other related operations as slowly as 1-ft. per minute, or as rapidly as 35-ft. per minute. For complete information send for bulletin 18.



Send today for
Heater-Planer
bulletin 18.



LITTLEFORD

LITTLEFORD BROS., INC.
454 E. Pearl St., Cincinnati 2, Ohio

2 1/4 Cu. Yd. Rubber Tired Tractor Shovel

The all-wheel drive Michigan Model 175-A, with a 2 1/4 cu. yd. capacity claimed to make it the biggest rubber-tired tractor shovel available, and the smaller 1 1/2 cu. yd. Model 125-A, their design, construction and operation are completely described and fully illustrated in a new 12-page catalog (No. 1250-P) offered by the Construction Machinery Division of Clark Equipment Co., Benton Harbor, Mich.

How a power shift transmission reduces operator fatigue and speeds work cycles; why a torque converter cushions shock loads and increases digging power; why planetary-wheel drive axles mean elimination of axle shaft breakage; these and many other important operational functions are completely explained. Four big cutaway drawings let you look inside the main components of the Michigan power train, to see how it's built and how it works.

Optional attachments show the many other jobs that can be done with a rubber-tired tractor shovel. Available are forks, backfiller blades, crane boom, snow plows, cabs, light material buckets, high flotation tires and hard rock tires. Range charts give dimensions on all major attachments.

For more information circle 138 on Service Coupon Page 16 and mail now.

Air Compressor

A new 8-page, 2-color, flier (Form 2302) released by Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y., emphasizes the 3R-36 cfm self-contained Spot-Air portable compressor. It also deals at length with the many tools it will operate. Actual on-the-job illustrations point out the added advantages of this lightweight compressor on jobs where bigger compressors are not needed. Weighing only 265 lb., the Spot-Air can be carried by two men, pushed on a wheelbarrow mounting by one man, or lifted to the back of the smallest truck.

For more information circle 139 on Service Coupon Page 16 and mail now.

Gradall Self-Propelled Wagon Carrier Model

An illustrated folder on the multi-purpose Gradall self-propelled wagon carrier model has just been issued by The Warner and Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

Unique feature claimed for the self-propelled wagon carrier mount is its great maneuverability, made possible by its tight turning radius and the convenient control panel, which gives the operator power steering, power shifting, and power brakes for the carrier through an instantaneous air-electric remote control system. Complete upperstructure engine and boom controls are also located for operator convenience and efficiency. There are no power take-offs, no complicated gear trains on the Gradall wagon. Separate engines for the carrier and upperstructure are stated to insure top efficiency in both operations. This feature is par-

ticularly valuable in crowded conditions. A 6 cylinder, 97 HP gasoline engine drives the carrier, and either gas or diesel power is available for the upperstructure.

For more information circle 140 on Service Coupon Page 16 and mail now.

Special Conveyor Belt Constructions

A new data sheet on its special conveyor belt constructions has been issued by the B. F. Goodrich Co., Industrial Products Division, Akron, Ohio.

Featured is "Rifle Grip" conveyor designed to retain or separate water content from the load during belt travel on inclined conveyors. The molded cover design has a "tread" which forms a horizontal carrying wall when a prescribed combination of conveyor incline and concentrating idler is used. Wet concrete may be carried without sluicing back. In dredging operations, a load can be drained of water by idler adjustment.

The data sheet also describes wire-inserted belts for foundry service. Ribbons of high tensile steel wires are inserted at intervals up to three feet to prevent accidental rips from running the entire length of the belt. Other constructions covered in the data sheet include a turnable conveyor belt, belts with stepped plies, reinforced covers and flanges.

For more information circle 141 on Service Coupon Page 16 and mail now.

Five Austin Overshot Loaders

A 6-page, 3-color catalog each of the 5 Austin overshot loader models has been announced by the Austin Division, Central Ohio Steel Products Co., Galion, O.

The catalog, which illustrates Models 2-C, 4-C, 6-C, 7-C and 8-C, contains action photos of each model, a large detail view of a typical Austin overshot loader, photos of hydraulic system components plus a schematic piping diagram. Condensed specifications and principal dimensions are shown. Available attachments are illustrated and described. The Austin overshot loaders are available in capacities from 1 to 4 cu. yd. and are designed for mounting on Caterpillar D2, D4, D6, D7 and D8 Tractors.

For more information circle 142 on Service Coupon Page 16 and mail now.

Tractor-Air Compressor Unit

An 8-page bulletin describing Le Roi's new 125 Tractair, a tractor-air compressor unit, has been published by Sales Promotion Department, Le Roi Division of Westinghouse Air Brake Co., 1706 South 68th St., Milwaukee 14, Wis.

Art work and half tones are used in the three-color bulletin which lists some of the many uses of the self-propelled compressor unit and its flexible tractor power. Applications of the 125 Tractair include driving form pins, drilling holes in quarry, lifting castings in a plant yard, towing airplanes, breaking concrete, loading trucks, trench digging and backfilling a trench. Twenty-one typical uses of the Tractair are listed.

For more information circle 143 on Service Coupon Page 16 and mail now.

Improved Concrete Cutting Blade

A new concrete sawing blade, the Clyde "Duo-Bond," developed by The Clyde Co., 205 6th St., Racine, Wis., is claimed to substantially reduce concrete sawing costs, especially for contraction joint sawing in new concrete. Secret of the new blade is in an entirely new diamond bond which is fortified through an exclusive process to provide an extremely hard cutting edge which greatly resists abrasion and wear, substantially prolonging blade life and thus reducing costs. The new Clyde blade has been used extensively on some of the major air bases and turnpikes, as well as other major paving projects throughout the country.

Another important feature of Clyde blades is their greater width, so designed to provide a sufficiently wide cut for easy application of all types of joint sealers. The Clyde Co. offers their blade in 12 in. and 14 in. diameters to fit any make of concrete sawing machine.

For more information circle 144 on Service Coupon Page 16 and mail now.

Literature for Welders

Two bulletins of interest to welders have been issued by Rankin Manufacturing Co., 616 Marengo Ave., Alhambra 2, Calif. Form A-7 is a new idea in cutaway templates that can be used in measuring the wear of Caterpillar rails, sprockets, idlers, grouser, and rollers.

Form A6-1 is a handy reference chart giving exact specifications for Caterpillar, International, and Allis-Chalmers tractor rollers and idlers. This sheet also shows step by step how to apply Ranite to all tractor and shovel parts.

For more information circle 145 on Service Coupon Page 16 and mail now.

Portable Metal Cutting Band Saw

The new Johnson Model M metal cutting band saw on wheels built especially for contractors is illustrated and described in a circular available from Johnson Manufacturing Company, Albion, Mich. The saw eliminates all hand cutting of structural steel, reinforcing rods, angle iron, steel pipe, conduits, etc. It handles 5 in. rounds and flats up to 10 in. wide. A special feature is the storage compartment in the front leg for extra saws so there is no waiting on the job for saw replacement.

For more information circle 146 on Service Coupon Page 16 and mail now.

Carco Fairleads

Specification sheet on Carco fairleads for all types of tractors, issued by Pacific Car & Foundry Co., Renton, Wash., contains illustrations of all fairlead models for use with model A, E, F and J Carco winches. Both three and four-roller fairleads are included with diagrammed description of operating parts and complete specifications. Swivel fairlead for Model A Carco winch is also included.

For more information circle 147 on Service Coupon Page 16 and mail now.

Air-Line Lubricators

The lubricators described in a new bulletin (Form 4169) on "Air-Line Lubricators," is available from Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y., are made in sizes for use with the smallest hand-held tools to the largest quarry-type drills.

Conservative estimates indicate that over 50 percent of air tool failures can be traced back to lack of sufficient or proper lubrication. Pictures illustrating damage to various parts of drills due to improper lubrication are shown in this piece of literature. A new air-line lubricator in 1/2 and 1 pint sizes described in this bulletin was designed to prevent this unnecessary loss with its consequent repair bill and "down-time."

A large size, two-color illustration shows the simplicity of construction, lack

of moving parts and the foolproof metering device of this new unit. A table on the back cover of the bulletin will help the user to select the proper size lubricator for the machine or units he has in operation.

For more information circle 146 on Service Coupon Page 16 and mail now.

Three-Wheel Rollers

A new 20-page bulletin (HWR-511) on its standard and variable weight 3-wheel roller line has been announced by Huber-Warco Co., Marion, O.

The bulletin features color photos of Huber-Warco 3-wheel rollers in action and describes in detail the company's 8, 10, 12, and 14 ton standard models and its 8-10, 10-12, and 12-14 ton variable weight rollers. With cross-sections, diagrams and photos the bulletin points out

features of the frame, transmission, gear train, final drive assembly, front end, operator's controls, ventilation, and attachments.

A special section lists the road machinery background of both companies which now make up Huber-Warco. This brief, historical digest tells of the achievements of both Huber and Warco since the early days of road machinery development. On the back cover is the complete line of Huber-Warco road building equipment including 3-wheel rollers, tandem rollers, motor graders and the Huber-Warco maintainer.

For more information circle 149 on Service Coupon Page 16 and mail now.

Scarifier Blades

A new folder on its scarifier blades has been issued by The Colorado Fuel and Iron Corporation, Denver, Colo. These blades have five teeth per running foot. They are specially designed to level, smooth and penetrate rough or rutted surfaces. It is claimed these blades are so effective in reworking road surfaces that they eliminate chuck holes and washboard ridges.

For more information circle 150 on Service Coupon Page 16 and mail now.

Portable Crushing and Screening Plant

A new 8-page catalog (No. D-103) on its single pass, portable crushing and screening plant has been issued by Diamond Iron Works, Division of Goodman Manufacturing Co., Halsted St. and 48th Place, Chicago 9, Ill. This plant is job-designed for counties, townships and small crushing contracts where mobility counts. Four models of this Diamond series 100 plant are available, with capacities of 30 to 90 tons per hour. Distinctive features of the plant are described and specifications for the four models are given.

For more information circle 151 on Service Coupon Page 16 and mail now.

Accident Prevention Guide

The National Safety Council's 1955 Occupational Safety Services Guide provides company safety directors with a complete catalog of the many and varied accident prevention aids available from the Council.

In the service guide, company safety men will find not only the tools they need to build their plant safety programs, but also the training aids available for instructing supervisors and workers. For the safety man, the 68-page guide provides a list of Council periodicals, newsletters and a complete library of technical and administrative publications covering all phases of occupational accident prevention. Information on the subjects covered in the basic and advanced courses of the Council's Safety Training Institute also is included.

Individual copies of Service Guide 2.1 may be obtained without cost by writing the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

For more information circle 152 on Service Coupon Page 16 and mail now.

SWENSON SPREADERS FOR ICE CONTROL

SPREADS SALT 200 LBS. PER MILE OR IN ANY DESIRED AMOUNT

Lays a Narrow Strip or Full Traffic Lane

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

Write for complete information

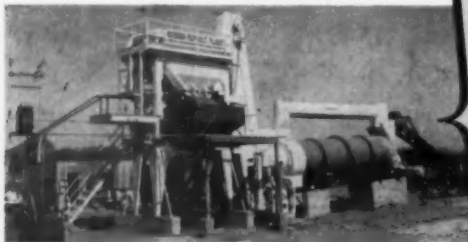
SWENSON SPREADER & MFG. CO.
LINDENWOOD, ILLINOIS



... for more details circle 230, page 16

NOTHING SMALL ABOUT THE PROFIT-MAKING ABILITY OF THIS Asphalt Plant!

Built with traditional MADSEN emphasis on fast-mixing, high daily production, low operating costs, and year-in year-out dependability... the MADSEN 2000-Lb. SPECIAL scores high in profit-making ability. It's small and compact, yet has many of the big-plant features and advantages found in the larger MADSEN Asphalt Plants. Check the list of features at the right, and you will see why this plant is considered one of the leading money-making small capacity asphalt plants in the industry.



- Famous MADSEN Twin-Shaft Pug Mill Mixer with air, steam or hydraulically-cylinder-operated discharge gate.
- MADSEN Asphalt Pressure Injection System (Patented)... which pumps the asphalt into the mill in 5 to 7 seconds.
- Springless dial scales for aggregate and asphalt. Convenient, fast controls.
- Double discharge bin gates.
- Unit construction for fast, easy erection.
- Press-brake steel columns and legs for increased accessibility without interference.

The above are only a few of the in-built MADSEN advantages. For the complete story, write for your copy of the MADSEN Catalog.

the **MADSEN**
2000-LB. SPECIAL



MADSEN WORKS

Division of Baldwin-Lima-Hamilton Corporation

14129 E. ROSECRANS AVE., P. O. BOX 38, LA MIRADA, CALIFORNIA, U. S. A.



Construction Equipment Division

... for more details circle 216, page 16

Self-Propelled Diesel Electric Revolving Crane

A new illustrated, 2-color folder describing a radically new self-propelled diesel-electric revolving crane is available from R. G. LeTourneau, Inc., 2399 South MacArthur, Longview, Tex. Each new feature is clearly illustrated through use of actual on-the-job photographs and statements of application. One innovation shown is electrically-powered outriggers which are set and retracted from the operator's cab.

Another feature discussed is self-propulsion through individually-powered electric wheels. The folder states that the crane has a 150-ft.-ton capacity and includes comprehensive graphs to show the effective working ranges of the unit with either a 30-ft. or 40-ft. boom.

For more information circle 153 on Service Coupon Page 16 and mail now.

Scrubbing, Washing and Sizing Plant

Features, construction, performance and operation of the Pioneer 405-W scrubbing, washing and sizing plant are all well described in a new 8-page bulletin issued by Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., subsidiary of Poor & Company, Chicago.

The attractive, 2-color folder features a 2-page cutaway illustrating the flow of materials through the plant, which can turn out up to five sizes and over-size of gravel and sand; also a page of drawings showing several of the many possible modifications that permit adaptation of the plant to almost any need. Advantages of this "package-type" washing plant, a description of all units, and specifications also are contained in the bulletin.

For more information circle 154 on Service Coupon Page 16 and mail now.

Single Deck Walking Draglines

A new, detailed and informative catalog WDS-155, covering its entire line of single deck walking dragline machines, is available from the Page Engineering Co., Clearing Post Office, Chicago 38, Ill. This 16-page catalog, is devoted exclusively to draglines ranging in size from 5 to 15 cu. yd. capacity.

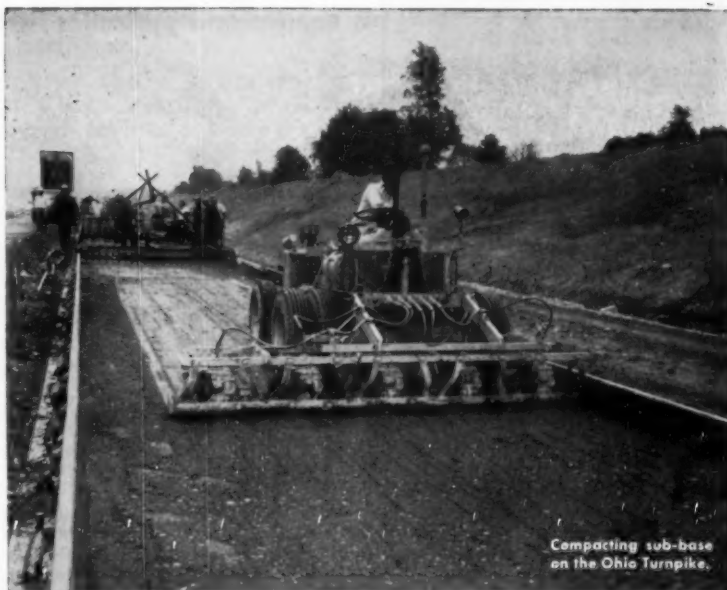
In addition, the catalog contains many application photographs showing dragline operations.

For more information circle 155 on Service Coupon Page 16 and mail now.

Protective Helmets for Construction Work

A complete line of Skullgard protective helmets developed for industrial workers, miners, and fire-fighters by Mine Safety Appliances Co., 201 N. Braddock St., Pittsburgh, Pa., is described in a recently published booklet. (No. 0600-3). In addition to informational material on the importance of head protection, the 16-page brochure contains descriptions of all models of MSA Skullgards and their applications.

For more information circle 156 on Service Coupon Page 16 and mail now.



Compacting sub-base on the Ohio Turnpike.

DO IT FASTER — BETTER and CHEAPER with the **JACKSON** **VIBRATORY COMPACTOR!**

MACADAM CONSTRUCTION: All around the country on major paving projects the JACKSON VIBRATORY COMPACTOR is being hailed as the most advantageous equipment ever developed for achieving specified density in rock, slag, soil-bound macadam, gravel and sand base courses. Uniform compaction to final density is obtained in rock macadam courses up to 12" in minimum time. The dry fines are quickly vibrated into all voids, filling them chockfull, solidly, from top to bottom of the course. Standard width is 13'3". Working speeds up to 60 FPM, reverse travel: 5 1/2 MPH.

SUB-BASES, GRANULAR SOIL-CEMENT PAVING and SAND FILLS: It is equally efficient on gravel sub-bases and granular soil-cement paving or base course construction. And it's a bear-cat for compacting sand fills such as bridge approaches, since it quickly achieves desired density and individual units may be subtracted and even fitted with operating handles to suit every condition and to get into the really tight places.

PAVEMENT WIDENING: In any granular material used in flexible base course widening specified density is accomplished in one pass with the compacting units towed in tandem at the side of the tractor. Interchangeable bases from 12" to 26" wide may be substituted for standard 26" bases to suit requirements.

By all means investigate this time and money saving equipment

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

... for more details circle 206, page 16

LUCAS ASPHALT COMPACTOR AND ROLLERTAMPER



Eliminates Hand Tamping

This portable, precision-built compactor is used for tamping and rolling asphalt close to walls, light poles, traffic signals and in all inaccessible places . . . and for use on all types of asphalt patching and repairing jobs.

Contractors, See Your Nearest
Dealer, or Write

LUCAS
ASPHALT COMPACTOR COMPANY
2209 E. Market St. Stockton, Calif.

. . . for more details circle 258, page 16

Equipment Application: Keller Firm's Busy Loader



● About 5½ miles of 30-year-old shell and gravel streets are being ripped up in Jefferson Parish, La., near the northern end of the Mississippi River bridge. All of the old surface will be removed, the roadway graded to a width of 24 or 26 feet, storm drains and curbs installed, and a concrete pavement placed.

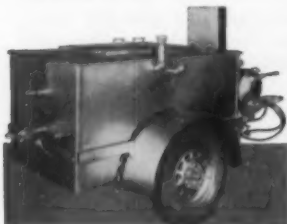
Keller Construction Corp. is using an International Drott TD-9 "Four-In-One" skid-shovel for a variety of jobs on the site. "A contractor can save money if he can bring one versatile machine to the job instead of two or more," said J. J. Burt, superintendent.

As a loader, it keeps 12 to 14 five-yard trucks busy on a half-mile haul. As a dozer, it cuts in hard intersections we barely scratch with bigger equipment. The Bullclam cuts cleanly in trenching for the curbs.

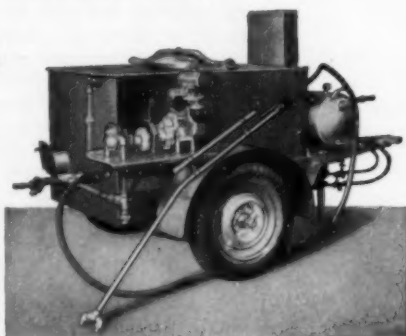
Early in the job, when trees had to be cut down and stumps removed, the clamshell (pictured picking up loose dirt) loaded the stumps.

White HEATING KETTLES

FOR SAFER MELTING
OF BITUMINOUS
MATERIALS



Tool Heaters
Surface Heaters
Special F-10 Compound
Kettle
Torches and Burners



Capacities from 80 to 325 gallons. All equipped with *exclusive FIRE PROOF TOP* (hinged tops available for roofing use). Operator and equipment are *protected* from flash fires. Complete line of accessories optional. Choice of kerosene and propane burners.

White MANUFACTURING COMPANY

ELKHART 20, INDIANA

. . . for more details circle 241, page 16

Industrial Tractors and Working Equipment

A new 20-page catalog, issued by John Deere, Moline, Ill., presents its modern line of industrial tractors and working equipment. The tractors shown and described include one track-type, the "40" crawler, and two wheel-types, the "40" Utility and the "40" Standard.

Integral equipment built by John Deere for the tractors includes front-mounted hydraulic bulldozer for the crawler, and heavy-duty center-mounted mower for the wheel tractors. Other matching John Deere equipment shown includes rear-mounted angling blade, rear-mounted scoop, front-mounted snow plow, rear-mounted fork lift, and such other equipment as road maintainer and rubber-tired material handling trailers and wagons.

For more information circle 157 on
Service Coupon Page 16 and mail now.

Portable Storage Tanks for Construction Jobs

A 12-page illustrated brochure, available from Aviation Products Division, Goodyear Tire & Rubber Co., Akron 18, Ohio, gives complete information in the constructive applications and advantages of collapsible storage tanks for storing bulk liquids as an emergency to temporary measure. The tanks have capacities of 900, 3,000 and 10,000 gals.

For more information circle 158 on
Service Coupon Page 16 and mail now.

GRACE Asphalt and Compaction Equipment



3 sweeper models, axle, engine or tractor powered.



Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.



Rapid Fire circulating heaters heat and unload large tanks of asphalt.



Sheepsfoot Rollers
250 to 600 psi.



Rapidspray Maintenance Distributors.
Also heaters for production melting
of barreled asphalt.



Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.

6007 South Lamar Dallas, Texas

... for more details circle 195, page 16

ROADS AND STREETS, August, 1955

Weather-Tight Cement Box

Bulletin 1601 issued by Dravo-Doyle Co., Fifth and Liberty Avenues, Pittsburgh 22, Pa., contains specifications and construction data on its recently-announced Cem-Matic cement box.

The new product is an all-steel enclosed box which is attached to the partition gates on dump trucks used in hauling cement and aggregates to dual drum concrete mixers. This weather-tight container keeps moisture out and prevents blowing of the cement. When unloading, the cement automatically mixes with aggregate which helps speed up the batching operation.

For more information circle 159 on Service Coupon Page 16 and mail now.

Power Unit

An 8-page booklet describing the U-164 power unit has been published by the industrial power division of International Harvester Co. The U-164 is a four-cylinder, valve-in-head gas or gasoline power unit which develops 36.5 HP at 1,800 rpm. Attachments for burning distillate or kerosene are also available.

The booklet gives full specifications and performance charts on the U-164 and also describes attachments that are available. To obtain the booklet, write to Consumer Relations Department, International Harvester Company, 180 N. Michigan Ave., Chicago 1, Ill.

For more information circle 160 on Service Coupon Page 16 and mail now.

Concrete Vibrators and Generators

A new 6-page, 2 color general catalog (LL-1231) describing Hi-lectric concrete vibrators and multi-purpose generators has been announced by Maginniss Power Tool Co., 154 Distl Avenue, Mansfield, Ohio.

It contains detail photos of all Hi-lectric structural concrete vibrator and generator models, cutaway views, line sketches and application photos plus complete descriptions of all units. Condensed specifications and accessories are shown.

For more information circle 269 on Service Coupon Page 16 and mail now.

Steel Grab

A bulletin (No. 0902-1) describing the M.S.A. steel grab, a heavy load grip for either vertical or horizontal pulls of steel plate or structural forms has been published by Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh 8, Pa. The MSA steel grab has double-acting jaws which automatically grip both sides of the steel plate when the load is applied. Operating on the principle of tongs, the grab takes a tighter grip as the load is increased.

Two sizes of grabs are available. The Model G-118 accommodates thicknesses up to 1 1/2 in. thick and weighing up to 12,000 lb. The smaller Model G-58 has a rated capacity of 6,000 lb. and handles steel up to 3/4 in. thick.

For more information circle 270 on Service Coupon Page 16 and mail now.



**"THIS LUBRICANT
DOUBLES THE
LIFE OF GEARS"**

—says TRINITY ALPS LUMBER CO.
Hayfork, California

"Our trucks have a forty mile county road logging haul over adverse grades, each truck making two complete round trips each working day. Our shop foreman in charge of maintenance, reports that with the use of LUBRIPLATE Lubricants there has been a minimum of truck down time and replacements of bearings and gears. The double reduction gears with LUBRIPLATE APG-140 has shown a saving of fifty per cent over previous operations."

**REGARDLESS OF THE SIZE AND
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LUBRIPLATE GREASE AND
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LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



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... for more details circle 215, page 16



It's Etnyre for even distribution at Douglas Oil Company of California

Douglas Oil Co. of California, located in Paramount, operates the front engine drive Etnyre "Black-Topper" shown above. The distributor is aluminum-jacketed, with stainless steel rear head.

The entire organization is "high" on the "Black-Topper." A. H. Peterson, Douglas driver, says: "Our Etnyre gives us positive control, even distribution, and smooth operation."

Woody Green, operator of the distributor, chimes in with "It takes a good machine and experience

for tack coating, and our Etnyre does a real job."

The clincher comes from V. R. Marichal, Assistant General Manager, who writes: "... it has always given entire satisfaction on our jobs and to other operators that we know who use them."

You, too, can have the distributor which has no equal for accuracy, dependability, and long-life economy. Instead of putting up with second best, get in touch with your nearby Etnyre Dealer or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS



... for more details circle 185, page 16
ROADS AND STREETS, August, 1955

PRICED TO SELL!

See These Bargains Now While They Last

LOCATED AT MINNEAPOLIS

IHC TD-24 with cable dozer and winch.
IHC TD-18A with cable dozer and winch.
IHC TD-18 with or without dozer.
IHC TD-14A with or without hydraulic dozer.

IHC TD-9 with hydraulic dozer.
Cat D8 with rear end winch.
Cat D4 with Traxcavator loader.
Adams 412, 414 and 512 motor graders.
Austin-Western 99M motor grader.
Buckeye 406 trencher.

LOCATED AT DULUTH

IHC TD-24 with or without dozer.
IHC TD-14 with hydraulic angle dozer.
IHC TD-6 with or without dozer.

Cat D2 and D4 with hydraulic angle dozer.
Cat RD6 with hydraulic angle dozer.

LOCATED AT CROOKSTON

IHC TD-18 tractor.
IHC TD-6 with hydraulic dozer.
Cat #11 motor grader with V and wing.

Miscellaneous wheel tractors with loaders, screens, compressors, water pumps and power units.

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Two Manitowoc 3000-Ba, long booms, jibs, wide cats., diesels, erection cranes, DL&CS, 2—120B Bucyrus-Erie Shovel Draglines, Ward Leonard Electric late models.
Two Northwest 6's—erection cranes—DL&CS, Murphy diesels — Ind. boom hoists — wide cats. — long booms — Also 80-D backhoe attachment.
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Bucyrus-Erie 38-B's, clam-drag-shovel and backhoe — wide long cats. Cat diesels.

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'50 Mack, 165 HP diesel engine, 10x20 tires, 10 sp. duplex trans., shutters, 12-24 volt elec. system, air brakes, saddle tanks, trailer conn. & hand control, 5th wheel, good condition \$2950

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Model 848 Barber-Greene Asphalt Plant Complete.
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All of above equipment located in Southeast

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7.50-16 8 ply, all traction, 1st	22.45
7.50-17, 8 ply, all traction, 1st	43.45
6.00-20, 8 ply, conv. tread, 1st	12.50
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7.50-20, 8 ply, conv. tread, 1st	41.50
7.50-20, 8 ply, Army Tread, 2nd	31.50
7.50-20 8 ply, Army Tread, T.O.	22.50
7.50-20, 10 ply, conv. tread, 1st	44.75
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315 Schramm air compressor.
 HD-15 AC bulldozer with double drum winch and 11 yard pan.
 D-6 late model Cat bulldozer.
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6x6 G.M.C. trucks\$1,500.00	895.00
6x6 Dodge, 1 1/2 ton trucks, winch	595.00
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1000 tarp, 17x40, \$58.00 each; 17x20, \$26.00 each; extra heavy, like new with grommets and rope. Radiator hose in 3 foot lengths, size 1 1/4, 1 1/2, 1 3/4, 2" \$1.00 for 3 feet; size 2 1/4 in 11" lengths, 25 cents each in lots of 40; used gun slings in lots of 5, 50 cents each; new C.H. Pink snow plow, V and straight blade, model 3598P, serial #92-SKE; large and small fork lifts.

All material is F.O.B. Chambersburg.

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Cost about \$2,000 each—

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6" jet Peerless 3-stage
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1201 Lima dragline, 85 foot boom, 2 3/4 yard buckets, Cummins diesel engine, 1950 machine, serial #3329, light plant, excellent condition, ready to work.

3500 Manitowoc dragline, 80 foot boom, two 2 1/2 yard buckets, Caterpillar D17000 engine, 1951 machine, serial #38000, light plant, excellent to work, excellent condition.

Three 10-wheel Sterling White dump trucks, two 1952 and 1948, 13 cu. yd. bodies, Cummins diesel, good rubber.

Bucyrus-Erie B-170A scraper, only 500 hours, like new.

Galion 101 motor grader, IHC diesel engine, cab, light, scarifier, hydraulic steer.

United house trailer, fully equipped, cheap. Hough HE 3/4 yard Payloader, excellent rubber and condition.

Lorain 40L 3/4 yard shovel and dragline, Waukesha gas, cheap.

Six Sterling 8 yard dump trucks, chain drive, models HC 144 and HC 145.

Hughes 40-ton low bed trailer and Auto Car tractor.

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TRANSPORT 25 Ton Lowboy, Tandem, Air Brakes, Road Ready \$1,750
11 NEW 18.00 x 24 Tires 28-Ply Factory Firsts. Standard Brands, Traction and Earth Mover Treads Each \$500
4 NEW 14.00 x 24 Tires 28-Ply. Rock Traction Treads Each \$300

AL FISHEL

1318 No. Vandeventer Ave., St. Louis, Mo.
Phone Jefferson 5-4482

1 1/2 YARD 33B CRANE

Bucyrus-Erie, 50 ft. boom, 1 1/2 yd. Dragline and 1 1/2 yd. Chamsell buckets. Cat. 11000 Engine. All good — \$10,000.

G. M. WATKINS

1056 Murfreesboro Rd. — 6-7964
NASHVILLE, TENNESSEE

FOR SALE SURPLUS LIME ROCK CRUSHING EQUIPMENT

1 Portable Universal jaw crusher 18x24 P.B. plate feeder, with new 26"x24" under-crusher, conveyor. P-30 International power \$2950.00

1 Completely rebuilt Gilson #222 hammermill mounted on hard rubber chassis, with 14"x24" conveyor; feeder powered by completely rebuilt 200 hp HXE Hercules \$3500.00

1 22-ft. Northern conveyor, 18" belt, powered by 22 hp VE4 Wisconsin, fair condition \$375.00

1 Completely rebuilt T-9 engine, new rods, pistons, clutch assy., etc., all accessories except radiator \$275.00

Can Ship Any Of Above Items By
Freight Car If Necessary.

MELVIN WAELTI

Monroe, Wisconsin

Ph. Juda, Wis., 912 after 8 o'clock a.m.

LOOK HERE FOR GI BARGAINS

International 3 ton 6x6 \$1475.00
Diamond-T 5 ton 6x6 1850.00
Beiderman 7 1/2 ton 6x6 1950.00
Dodge 1 1/2 ton 6x6 525.00
Clark towing tugs 350.00
Autocar 5 ton C.O.E. 4x4 750.00
G.M.C. 3-4 ton, tandem 1100.00

Each unit checked and reconditioned
in our shop. Mechanically guaranteed.

McKIE-HUNT MOTOR SERVICE, INC.

518 - 13th Street — Phone 20491
AUGUSTA, GEORGIA

FOR SALE

One (1) 1 1/4 yard Osgood Heavy Duty Clam Shell without Bucket, Shop No. 2240, 45 ft. Boom. Can be seen in operation. Price \$3,000 f.o.b. our plant.

SOUTH BEND SAND & GRAVEL CORP.

3113 Lincoln Way West
South Bend 28, Indiana

FOR SALE — STEEL FORMS

30,000 square feet of used—good to excellent condition—Atlas Steel Speed forms. Pans are 6 and 8 inches wide and 4, 5, 6 and 8 feet long. Includes 150 corner pans.

E. & E. J. PFOTZER

P.O. Box 126 Wilmington, Del.

FOR SALE

20 Euclids 46-TD Rear Dump, Cummins Diesel. New 25 Ton Type.

11 Caterpillar D-8, 13A Bulldozers.

2 Marion 111-M Shovels.

2 Bucyrus 54-B Shovels, Buda Diesel.

4 I-R Compressors, 600. S/N 4400's.

Above Equipment Purchased New 1954

2 Bucyrus 22-B Backhoe, Cat. Eng. 1953.

ROY M. JOHNSON

644 Plymouth Rd. — Ridgeway 7-9201
Baltimore 29, Maryland

SELLING OUT!

D4 Traxcavator, Motor Overhauled \$1,800.00
D7 7M Series with Cat Cable Angle Blade \$4,500.00
1950 Unit 614 1/2-yd. Dragline. Complete with Bucket \$4,800.00
No. 11 Cat. Patrol \$800.00
With V Snow Plow \$950.00
1948 Reo Trac. Like New Tires. Single Axle Lowboy. Good Shape. \$1,400.00

Have to quit the business reason for selling.
Would make a better price for the lot.

JOHN RUPE RUTLAND, ILLINOIS

DRAGLINE—CRANE—BARGAINS

1201 Lima diesel 85' boom, 3 yard bucket. Independent boom hoist. \$17,000.00.

K-480 Link Belt diesel 70' boom, 2 yard bucket. Completely rebuilt. Independent boom hoist. \$16,500.00.

604 Lima 60' boom 1 1/2 yard bucket. Independent boom hoist. \$20,000.00.

Real Good Machines

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. Gladstone 5-3658

FOR SALE

New Rex 6S Concrete Mixer, with 4 cylinder aircooled engine, on two pneumatic tired wheels \$ 950
Shovel Front for Northwest Model 25 1,500
Page 3 yard RH Dragline Bucket 800
New Blaw-Knox 1/4 yard Clamshell Bucket 900
Adams Model 201 Motor Grader 2,000
Allis-Chalmers Model D Motor Grader Rebuilt and guaranteed 3,000

McClung-Logan Equip. Co., Inc.

4601 Washington Blvd. Ph. Arbutus 3900
BALTIMORE 27, MARYLAND

**SURPLUS EQUIPMENT
FOR SALE
MAKE US AN OFFER**

- 1 HD15A — Ser. 2734 with Gar Wood Hydraulic Tipdozer — 1 year old — used 700 hours.
- 1 HD15A — Ser. 800 with Gar Wood Front Mounted Cable Dozercaster — 3 years old — used 1800 hours.
- 1 HD9G — Ser. 787 with T59 Tracto Shovel, hydraulic Front Mounted — 4 years old — Counterweight.
- 1 HD9G — Tractomotive Dozer.
- 1 HD5G — Ser. 8252 with T55 Tractor Shovel, Hydraulic Front Mounted — Counterweight.
- 1 HD5G — Ser. 9215 with T55 Tracto Shovel, Hydraulic Front Mounted — Counterweight.
- 1 Baker Double Drum Control Unit for HD15 or HD9.

All above available for inspection at our Greenville, South Carolina Warehouse.

Call J. H. Link — Greenville 2-7633

McKoy-Helgerson Co.
Greenville, South Carolina

**150
ARMY
SURPLUS
JEEPS**

**PRESCOTT
TRUCKS SALES, INC.**

Ludlow 5-4400
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Bronx, N.Y.

**USED EQUIPMENT
BARGAINS**

- 1—LE TOURNEAU Model Super C Tournadozer, mounted on 21x23-16 ply tires and powered with a factory new GM-6-71 diesel engine \$10,000
- 1—Pioneer 54x24 Triple Roll Crusher and powered with a rebuilt GM-6-110 diesel power unit 16,500
- 1—LE TOURNEAU Model LP Tractor Drawn Scraper 4,000

CONTRACTORS MACHY. CO.
530 Monroe Ave. N.W.
GRAND RAPIDS, MICH.
Phone: Glendale 6-5484

FOR SALE

- 2 Butler Cement Unloaders
- 1 Jaeger Finishing Machine 20—25'
- 1 D8 Tractor U Series

BOOTH & OLSON, INC.
Sioux City, Iowa

FOR SALE

9W Bucyrus-Erie all Electric Walking Dragline, 8 yard bucket, 200 ft. boom. Excellent condition.

Frank Famalette Equipment Company
Box 325 Hazleton, Pa.
GL 5-1323

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**Immediate Delivery
Excellent Condition**

**OUTSTANDING VALUES
IN USED CONCRETE
PAVING EQUIPMENT**

- 2—Koehring 34E dual drum pavers—nearly new.
- 2—Jaeger and Blaw Knox 20'-25' concrete finishers and spreaders.
- 1—Buckeye R.B. Finegrader for 20'-25'.
- 2—Blaw Knox 10'-15' spreaders and finishers.
- 1—Buckeye R.B. 10'-15' finegrader.
- 1—P&H Single Pass Stabilizer.
- 5,000 ft. Heltzel 10"x8" road forms.
- 5,500 ft. Blaw Knox 9"x9" road forms.
- 3,000 ft. Metaform 8"x8" road forms.
- 4,400 ft. Heltzel 12"x16" reversible forms.
- 8,000 ft. Heltzel 12"x18" reversible forms.

Write — Wire — Call

AL J. GOODMAN

Dealer in Used Contractor's Equipment
Office 36456 Nite 5668
P.O. Box 263 ASHEVILLE, N.C.

Koehring Paver

1 Model 16E twin batch Koehring Paver on rubber, Serial No. 24723, has actually mixed 25,000 cu. yds. concrete, price including batch boards and cement boxes for six trucks, \$12,000. Machine located at Shelburn, Indiana. Contact:

HART & HART

P.O. Box 52 — Clay City, Indiana
Phone Center Point, Ind. 35 Ring 30

ROAD EQUIPMENT

- 1—Barber Greene Finisher
 - 1—Adnun Spreader
 - 1—No. 12 Autopatrol
 - 2—Seaman Pulvi Mixers
 - 2—AC Front End Loaders Model HD5G
 - 1—CHE 3-4 Ton Roller
 - 1—3800 Gal. Semi Trailer Water Tank
 - 1—Gradall M-2460 — Lot No. 18 — Serial No. NP23205 — Mounted on Gradall Under-Carriage Model 6-4.
- The Bituminous Construction Co.**
MOhawk 4-4877
Baltimore 15, Md.

**NEW! NEW!
Two For \$48.50!**



**PNEUMATIC TIRED CARTS
(Government Surplus)**

Specifications

(Approximate)

- Overall width, hub cap to hub cap, 39"
- Overall length, tip of tongue to end of box 68"
- Tongue and center axle clearance from ground 12"
- Stub Axle casting clearance from ground 9"
- Box measurements (inside) 32"x24"x5"
- Bare net weight 110 lbs.
- Gross weight, two carts, knocked down and boxed 353 lbs.
- Tires, heavy duty, 4-ply ribbed tread, Implement type 4:00x12"
- Tire height, approximate 20"

Ideal for mounting small pumps, generating plants, compressors, welders, etc. Use the trailer "as is" with wood platform mounted on top of trailer box for portable shop work bench. These fine, sturdy, all steel carts can easily be widened to any width and can be made narrower. The Carts would make ideal tip-up Carts for shop acetylene welding tanks. You will find enumerable uses for these outfits, so order a good supply TODAY!

Ideal To Make Into Concrete Carts

PRICES

Two Carts, KD, Complete — \$48.50

Low Prices are for Check With Order, Only. Shipped Truck Freight collect. Sold only in Multiples of Two (Two Per Box).

Nationwide Supply Co.

P.O. Box 547-B
Rapid City, South Dakota

FOR SALE

- 1—Browning T-20 Truck Crane, 30 ft. Boom, Waukesha & Hercules powered, 1954. Little used \$19,500
- 1—Lorain T.L. 20 Truck Crane, 30 ft. Boom, Waukesha's up and down. Newly conditioned \$10,000
- 2—Koehring 605-1B Crawlers—Long Cuts 30' Pads, 1 1/2 yd. 30 ton capacity, Collapsible Gantry. Unbelievably clean, each \$26,500

Lester Kehoe Machinery Corp.

1 East 42nd Street
NEW YORK 17, NEW YORK
Tel.—Murray Hill 2-5481

FOR SALE

- | | |
|--|---|
| 1 Koehring Model 302 combination shovel, hoe and crane. | 1 Used Universal 42"x8' single deck screen. |
| 1 Koehring Dumptor, diesel powered. | 1 Rosco Model RMT trailer-type maintenance unit, 600 gal. capacity with 4' spray bar, powered by Wisconsin VE4 gasoline engine. |
| 1 FWD Model CU 3½-ton, 4-wheel drive truck with plow and wing. | 1 Case Model DI wheel tractor equipped with Lull Model 4B front end loader, 3-yard capacity, and Henry back hoe attachment. |
| 1 Ford rubber-tired wheel tractor with Dearborn hydraulic loader with two buckets. | 1 Blaw-Knox 2 cubic yard truck mixer powered by Hercules gasoline engine. |
| 1 Barber-Greene track-type trenching machine. | |

All in good condition and reasonably priced.

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3024 S.E. 4th St.

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CONSIGNMENT AUCTION Heavy Construction Equipment

At 10:00 a.m. (CST) on the last Friday of each month, an auction will be scheduled. Equipment to be sold is cranes, shovels, cats, motor patrols, scrapers, dozers, trenchers, rollers, crushers, pavers, finishers, trucks, trailers, parts, tools and so forth. Everything positively sells to the highest bidder. Equipment sold in the order consigned. C.M.C. Auctions advertising goes before more than 75,000 persons in the United States and Canada. Your assurance of a fair deal to buy or sell.

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750-20 8-Ply Army Takeoffs, Perfect	\$20.95
750-20 Army Tread Good Condition	12.95
900-20 Heavy Duty M&S Used	25.00
900-16 Heavy Duty Army Tread	12.95
900-20 Perfect Combat Tires	
(Equal to 20-Ply)	35.00
1100-20 Heavy Duty Good Condition	25.00
1100-22 Heavy Duty Good Condition	25.00
825-20 Heavy Duty Good Condition	20.00

Write for prices and sizes not listed.
Send check or money order or 25%
balance C.O.D. Freight Collect.

BARON TIRE CO.

120 Second St. Chelsea, Mass.
Chelsea 3-2737

Everyone Saves at BARONS
All types of heavy work tires. Excellent condition.

750-20 8-ply
Army Surplus
Full Tread
17.95

Terrible Value
Perfect Casings



FOR SALE

Koehring 1½ Yard Model 601, shovel and dragline, Serial 1239, just finished large rock job. \$12,000.00

Jaeger 125 Air Compressor, like new. \$2,000.00.

Garwood Scoop, 2 wheel, 5 yard hydraulic, new. \$1,000.00

VIC KOEPKE

Pattonville, Mo.

Tel. Pershing 1-0469

FOR SALE

EUCLID REAR DUMP TRUCKS

Model 5W Bucyrus-Erie Dragline, 8 yd.
Model 1055 P&H shovel & drag 3½ yd.
Model 1680 P&H shovel 6 yd.
Model 54B Bucyrus-Erie shovel 2½ yd.
Model 54B Bucyrus-Erie dragline 2½ yd.
Model 38B Bucyrus-Erie shovel 1½ yd.
Model 120-B Bucyrus-Erie shovel & drag 5 yd.
Model 170-B Bucyrus-Erie shovel 6 yd.
Model 200-B Bucyrus-Erie dragline 5 yd.
Model S-W Bucyrus-Erie dragline 6 yd.
Model 4500 Manitowoc dragline 5 yd. & 5 yd. shovel.
Model 4161 Marion shovel & drag 5 yd.
Model 7400 Marion dragline 9 yd.
Model 80-D Northwest shovel 2½ yd.
Model 6 Northwest shovel 1½ yd.
Model 1201 Lima dragline 3½ yd.
Model 3500 Manitowoc dragline 2½ yd.
5-10 wheel model LJ diesel Mack dump trucks—\$20,000.00
25 ton Link-Belt truck crane.
Rogers lowbed trailer.

WILLIAM LUBRECHT, III Construction Equipment

311 W. Dimond Ave. Hazleton, Pa.
Gladstone 5-4041 or Gladstone 5-0253

3—10"x20" Champion Jaw Crushers.

1—Austin-Western Portable Plant — 10" x 16" overhead eccentric Jaw Crusher, driven by 6 cylinder I.H. Gasoline Engine. Steel frame, wheels and draw bar.

1—Complete "Pioneer" Cinder or Slag Crushing and Screening Plant — 10"x20" crusher, 40"x22" rolls, D.D. 4'x12' screen, 4 belt conveyors, bucket elevator, two bins. All motors & drives. Near Philadelphia.

1—12" Enclosed Cent. Disc. Elevator, 78" Centers with Motor. Heavy case.

14—Speed Reducers, 2 to 15 H.P.

1—New 3'x5' Link-Belt U.P. Shake-out.

Johnson & Hoehler, Inc.

P. O. Box 102

Lansdowne, Pa.

CHEVROLET M6 4x4 1½ TON TRUCKS

With and Without Winches

Priced from \$175.00 to \$650.00 depending on condition, location and equipment. We have complete stock of parts for these units as well as parts for many other military type vehicles.

Large Selection of Other Military Type Vehicles

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DETROIT, MICH.
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ATTENTION!

PAVING CONTRACTORS

ReX Model 27E Paver. Serial No. G-9125, has Waukesha gas engine. Bargain at \$2500.00

Koehring Model 27E Paver. Serial No. 16407 With Waukesha gas engine. Has extra drum. Price \$1750.00

Jaeger 3 yd. Transit Mixer #J-4599. \$525.00

Jaeger 2 yd. Transit Mixer #J-4775. \$450.00

EARLE EQUIPMENT CO.

2424 28th St. S.E.

Phone: Cherry 5-9247

GRAND RAPIDS, MICHIGAN

SACRIFICE

1005 Koehring Stripper shovel 2¼ yd., new Sept. 1953, worked about 12 months. Excellent condition.

TD-25 bulldozer — serial No. tde 4191.

Bucyrus-Erie 22B shovel, serial No. 93861.

Lorain 75-B—1½-yd. shovel, serial No. 4278. Miscellaneous drills, pumps, etc. Sell all as complete unit or separate.

Now working Jasper, Tennessee.

Carmichael Coal Co.

JASPER, ALABAMA

Phones 23254 — 25320

FOR SALE

LIMA 34 HOE MACHINE

Equipped with Camelback Type Boom. Excellent Buy.

Contractors Machinery Co.

333 Midland Ave. — Detroit 3, Mich.

EQUIPMENT PRICED FOR QUICK SALE

- 1—Buckeye Hi-Way Widener Mod. 616-45 with 24", 30", 36" and 48" buckets, G.M. Diesel Eng. Mod. 371, 1½ yr. old.
- 1—Austin-Western Grader Model 99-H, Ser. No. H3584, International Diesel Eng. Mod. UD 14A, Ser. 28179, fully equipped.
- 1—Lima No. 34 Paymaster Shovel, Ser. 2322, with G.M. Diesel Eng. Mod. 371; ¾ C.Y. Shovel Front, ¾ pull shovel attachment, 35' Crane Boom with fair leads.
- 1—Apsco Widener, Model 95, Ser. No. 203, 1 yr. old.
- 9—G.E. 60 Watt two way mobile radio stations and
- 2—G.E. 30 Watt two way radio base stations.

BLACK TOP PAVING COMPANY, INC.

9 East Beau St. Washington, Pa. Telephone: Washington 9305

Convert Pick-up Trucks to SERVICE Trucks with STAHL Utility Side Boxes!

Safe, dry storage of tools and materials in LOCKED compartments. Stahl Side Boxes mount quickly on ANY pick-up truck, cost little, outlast the truck itself. WRITE for FULL INFORMATION & PRICES.

STAHL METAL PRODUCTS, INC.

3497 W. 140th St. Cleveland 11, Ohio

FOR SALE

- 1—Bucyrus-Erie model 54-B combination shovel & dragline with 70 ft. boom, Page 2½ yd. dragline bucket, Buda Lanova diesel engine, excellent condition, used approximately one year.
- 1—Parson model 250-2A ditching machine 12.6" cutting depth, 24" bucket line, General Motors diesel engine, excellent condition, used approximately 6 months.
- 1—Gar Wood CD-203 Angledozer for HD-20, new.
- 1—Gar Wood CT203 Straight-dozer for HD-20, new.
- 1—Oliver OC-18 tractor with Heil cable Angledozer, excellent condition, only 1½ years old. Priced right.
- N-W Model 6 Dragline, 50 ft. boom, Murphy diesel engine, approximately 3 years old.

Van Lott, Inc.

430 Meeting St.—West Columbia, S.C.
Phone 38311

FOR SALE

One 18-months-old Barber-Greene Model 804 Mixall on Rubber Tires, Serial No. 804-52-103, with Wisconsin Air-cooled Engine. Like new, used only four months. Priced new \$5,800 — will sell half price.

McDONOUGH CONSTRUCTION COMPANY OF GEORGIA

7 Baltimore Pl. N.W. Atlanta, Ga.
Telephone: Elgin 4861

FOR SALE

ASPHALT PLANT

Simplicity S-100, 5000 lb. pugmill, 4 ft. x 12 ft. double decked vibrating screens, 10 ft. x 20 ft. double shell dryer.

Boiler and asphalt pump AC line. Dust cyclone and filler dust bin and elevator, cold feed bin.

Write Box 1147

Roads & Streets

22 W. Maple St., Chicago 10, Ill.

Subject to Prior Sale

SHOVEL

MICHIGAN Model C-16 on Crawlers.
½ Yd. Rebuilt and Guaranteed.

ANDERSON EQUIPMENT CO.
Box 1737 Pittsburgh 30, Penna.
Phone: LEhigh 1-6020

FOR SALE

LORAIN TRENCH HOE

Small Model 40, ¾ yard machine.
10 ft. crawlers, 30 in. treads.

Contractors Machinery Co.
333 Midland Ave. — Detroit 3, Mich.

FOR SALE

Immediate Delivery—Excellent Condition

OUTSTANDING VALUES IN USED ASPHALT PAVING EQUIPMENT

All Late Models

- 1—Barber Greene 848 asphalt plant, complete & in excellent condition ready to go. Priced right.
- 1—H & B asphalt plant, complete with 4,000 lb. pugmill & good shape thru-out.
- 2—Barber Greene 879A asphalt finishers.
- 1—Galion 8-12 ton tandem roller.
- 1—Galion 5-8 ton tandem roller.
- 2—Galion 10 ton 3 wheel rollers.
- 2—Three axle tandem rollers.

WRITE — WIRE — CALL

AL J. GOODMAN

Dealer in Used Contractors Equipment
Office 36456 Nite 5668
P.O. Box 263 ASHEVILLE, N.C.

HOSE HOSE

12½ Per Foot

NEW 5/16 2-braid hose, useable for air, water, paint, etc. Also for Heavy Duty oxygen and acetylene work.

Available only in 50 foot lengths with couplings.

This hose has been tested and guaranteed to withstand 400 lbs. pressure.

Freight prepaid on orders of 1,000 feet or more.

HUNT STEEL COMPANY, LTD.

123 Puuhale Road
HONOLULU, HAWAII

FOR SALE

- 1—5 yd. Daniels cable controlled scraper, like new condition . . . \$750
- 1—Model M LeTourneau D.D.C. P.U. for a D7 Cat rebuilt . . . 450
- 1—Brand new 2 yd. heavy duty drag bucket, complete with all chains and teeth . . . 950
- 1—3 cyl. G.M.C. Diesel motor . . . 750

CENTRAL SALES & SUPPLY CO.

1737 N. 30th St. Milwaukee 8, Wis.
Division 2-8245



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Hotel MIRAMAR AND BUNGALOWS
SANTA MONICA, Calif.

California's World-Famous Resort—250 rooms
WILLIAM W. DONNELLY, Manager

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SACRAMENTO, California

The Capital's Premier Hotel—400 rooms
CHARLES W. COLE, Manager

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GALLUP, New Mexico

World's Largest Ranch House—200 rooms
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CHARLES W. COLE, Manager

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Hospitality at its Best—700 rooms
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World-famed hotels—
Teletype service—Family Plan

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ENGINEERS,
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STREET MAINTENANCE DEPTS.**

AIR DRIVEN PUMP

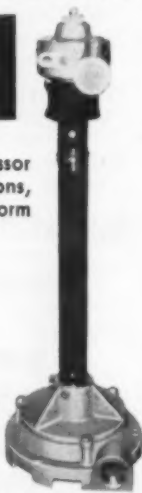
Runs from any compressor
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ditches, postholes, storm
sewers, etc.

- completely submersible
- all bronze and stainless
- 1 1/4" discharge
- 33 GPM 15' TH ONLY

\$95

F. O. B.
Johnstown

Send check or \$15. with balance C. O. D.



M. GLOSSER & SONS, INC.
80 Messenger St., Johnstown, Pa.

... for more details circle 234, page 16

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With the Manufacturers and Distributors

TOBIN NAMED GENERAL SALES MANAGER. P. E. Tobin, heretofore North Atlantic regional manager, has been appointed general sales manager of the Truck Division of The White Motor Co., with headquarters in Cleveland, O. He succeeds J. N. Bauman, who is now executive vice president.

NOPSON NAMED HYSTER EXPORT REPRESENTATIVE. Donald H. Nopson, has been appointed export field representative for Hyster Co., Portland, Ore. He will cover Venezuela and Columbia.

NEW HOUGH DISTRIBUTOR. M. W. Construction Equipment Division of Metalweld, Inc., Philadelphia, Pa., has been appointed exclusive distributor for Frank G. Hough Co., in eastern Pennsylvania, southern New Jersey and New Castle, Del.

NAMED ADVERTISING MANAGER CLEAVER-BROOKS. Karl K. Hilgendorf, formerly associated with Allis-Chalmers and Johnson Service Co., has been appointed advertising manager of Cleaver-Brooks Co., Milwaukee, Wis. He will have responsibility for planning and directing nationwide advertising plans for the company's farm divisions.

HUBER - WARCO NAMES DISTRIBUTORS. Huber-Warco Co., Marion, O., has appointed the following distributors for its complete line of tandem rollers, 3-wheel rollers and graders: Euclid-Arkansas, Inc., 702 West Second St., North Little Rock, Ark.

HUNTINGTON NEW P & H DISTRICT MANAGER. Harnischfeger Corp., Milwaukee, Wis., has appointed James C. Huntington district manager in the New York office for P&H power cranes and shovels.

KERR ELECTED VICE PRESIDENT BUTLER BIN. Kenneth P. Kerr, for the past 12 years sales manager of Butler Bin Co., Waukesha, Wis., has been elected vice president in charge of sales. Morgan R. Butler, Jr., has been elected vice president in charge of production.

NEW MANAGER DETROIT DIESEL FLORIDA BRANCH. E. F. Bentley, general sales manager of the Detroit Diesel Engine Division of General Motors, has appointed Royce A. Hill manager of Florida Diesel Engine Sales, the Division's branch covering most of the state of Florida. In his new capacity Mr. Hill will head Detroit Diesels' industrial and marine sales and service activities in Florida with headquarters in Miami and a branch in Jacksonville. He succeeds E. G. Duerk who died suddenly in May.

Plenty of LIFT!
with
MONARCH POWER HYDRAULICS
for Snow Plows and Road Machinery

The HEP "Dynamight"
ELECTRIC POWER CONTROL

FOR NEW OR EXISTING EQUIPMENT

FITS ALL TRUCKS — is FAST and EASY to Install

Available for 6 or 12 Volt Systems

1000 lbs. pressure
1 gal. per minute volume

Fan Belt Models Also Available.

MONARCH ROAD MACHINERY CO.
1331 MICHIGAN ST. N.E.
GRAND RAPIDS 1, MICH.

... for more details circle 249, page 16

Servicised
PARA-PLASTIC JF JOINT SEALER

RESISTS SOLVENTS AND JET FUEL SPILLAGE

Temperatures to 180°F do not affect Para-Plastic sealing efficiency

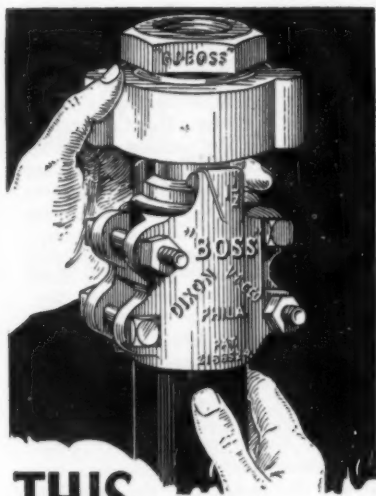
Para-Plastic JF remains plastic, maintains bond at sub-zero temperatures

Airport runway and apron joints sealed with Para-Plastic JF — an exclusive Servicised development — will stay sealed in temperatures from sub-zero to 180°F and resist the disintegrating effects of fuel or petroleum solvent spillage. Para-Plastic JF forms a resilient, adhesive and effective plastic seal that insures maximum joint protection. Can be pumped directly from melting kettle into the joint — a fast, low cost method of application.

Write for complete details on Para-Plastic JF today.

SERVICISED PRODUCTS CORPORATION
6051 W. 65th ST., CHICAGO 38, ILL.

... for more details circle 222, page 16



THIS Washerless COUPLING

has no equal for efficiency, durability and safety in every high or low pressure hose service . . . steam, water, gas, air, oil, hydraulic. Ground joint union between stem and spud provides leakproof, trouble-free seal. Furnished with super-strong, "Boss" Offset and Interlocking Clamp.

"GJ-BOSS"
GROUND JOINT
FEMALE COUPLING
STYLE X-34

All parts steel or malleable iron, thoroughly rustproofed. Sizes 1/4" to 6", inclusive.

Stocked by Manufacturers and Distributors of Industrial Rubber Products

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Valve & Coupling Co.

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DIXON VALVE & COUPLING CO., LTD., TORONTO, Associate Companies:
Rock Iron Company, Inc., Garyville, Pa. • Precision Drawn Steel Company, Camden, N.J.

... for more details circle 180, page 16

ROADS AND STREETS, August, 1955

NEW DISTRIBUTORS FOR LE TOURNEAU-WESTINGHOUSE. Richmond Machinery and Equipment Co., Inc., 1701 Roseneath Road, Richmond, Va., has been named distributor for Le Tourneau-Westinghouse equipment including motor graders and traveloaders of the firm's Adams division. The territory will cover Virginia, with the exception of Frederick, Clarke, Loudon, Fairfax, Arlington, Northampton and Accomac Counties. Vivian Equipment Co., 1606 Grand Ave., Ames, Ia., has been appointed western Iowa distributor for the line of high-speed, rubber-tired earth moving equipment.

NAPCO APPOINTS DIRECTOR OF MARKETING. Fred Hartlage has been appointed Director of Marketing for Napco Industries Inc., Minneapolis, which manufacture Napco self-contained loaders. This new position in the firm was created to integrate and coordinate sales promotion, public relations and advertising of the rapidly expanding divisions of Napco.

DIXON ELECTED PRESIDENT DART TRUCK CO. George F. Dixon, Jr. heretofore vice president of Carlisle Corporation, Carlisle, Pa., of which Dart is a subsidiary, has been elected president of Dart Truck Co., Kansas City, Mo.

SIX NEW DEALERS FOR CLARK EQUIPMENT. Six new dealers have been appointed to sell and service the Michigan line of tractor shovels and excavator cranes, products of the Construction Machinery Division of Clark Equipment Co. The dealers and their territories: Stephens Equipment Co., 818 S. W. Ninth St., Des Moines, Ia., for central Iowa; R. E. Common Equipment Co., 1515 S. Washington St., Peoria, Ill., for west-central Illinois; Machinery Outlet, Inc., 7333 S. Broadway St., Wichita, Kan., for central and western Kansas; Totem Equipment Co., 3706 Airport Way, Seattle, Wash., for Washington (except for five southwest counties) and northern Idaho; West Virginia Tractor and Equipment Co., Charlestown, W. Va., for West Virginia with the exception of the counties of Marshall, Ohio, Brooke, Hancock, Morgan, Berkeley and Jefferson. The company was previously selling only Michigan excavator cranes; Barker Equipment Co., Fredericton, New Brunswick, Canada, for the province of New Brunswick.

LESCHEN APPOINTS JOHNSON. Robert M. Johnson has been appointed district sales representative for Leschen Wire Division, H. K. Porter Co. Inc. His territory includes all of New England and eastern New York State. Mr. Johnson has had considerable experience in the selling of wire rope. Since 1951 he has specialized in wire rope for the oil fields of Pennsylvania as branch manager of a supply company.

NEW MARION DISTRIBUTOR. John W. Patterson Co., 128 Hanover St., Rook Station, Carnegie, Pa., has been appointed distributor in western Pennsylvania and northern West Virginia for Marion Power Shovel Co., Marion, O.

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- Cuts loss of valuable time!
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... for more details circle 179, page 16



- One of the highlights of the recent Caterpillar Exposition at Peoria, Ill., was the Big Parade at the firm's 900-acre proving grounds when Caterpillar dealers saw more than 80 different machines demonstrating the company's full line of tractors and earthmoving equipment.



- More than 350 dealers from throughout the world attended the Caterpillar Exposition in June at Peoria, Ill. Among the 218 U.S. and Canadian dealers, were these four, seen visiting with Caterpillar's domestic sales manager W. S. Zeigler; W. B. Pringle, president of Pringle Tractor Co., Salinas, Cal.; H. S. Darr, president of Darr Equipment Co., Dallas, Tex.; B. C. Patten, president of Patten Tractor and Equipment Co., Bellwood, Ill.; Mr. Zeigler; and Robert Hewitt, president of Hewitt Equipment Limited, Montreal, Quebec, Canada.

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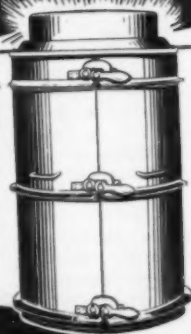
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... for more details circle 220, page 16

NEW DISTRIBUTORS FOR MARION-OSGOOD-GENERAL. The following new distributors to handle the combined lines of Marion-Osgood-General equipment have been announced by Marion Power Shovel Co., Marion, O.: Construction Machinery & Supply Co., Inc., 128 S. St. Clair St., Toledo, O., for northwestern Ohio; Talbert Construction Equipment Co., 7950 West 47th St., Lyons, Ill., for northeastern Illinois and northwestern corner of Indiana; Weaver Truck, Trailer and Body Corp., 2405-15 North Wooster Ave., Dover, O., for northeastern Ohio; Western Machinery & Engine Co., 320 S. Grand Blvd., St. Louis, Mo., for eastern Missouri and southern Illinois; Calavar Corporation, 2700 South Broadway, Los Angeles, Calif., for Los Angeles and southern California; Buran Equipment Co., 777 1000th Ave., Oakland, Calif., for northern California; Midwestern Engine & Equipment Co., Inc., 4643 Sapulpa Road, Tulsa, Okla., for state of Oklahoma; Central Supply & Equipment Co., Danville, Ky., for state of Kentucky; Martin Tractor Co., Inc., U. S. Highway 75 South, Topeka, Kans., for eastern Kansas; James G. Hoag Co., 33rd Ave. and Arch St., Philadelphia, Pa., for southeastern Pennsylvania, southern New Jersey and state of Delaware; R. B. Wing and Son Corporation, 384-386 Broadway, Albany, N.Y. for southeast New York and southwest Vermont; Casey & Dupuis Equipment Corp., 340 Pleasant St., Watertown, Mass., for eastern Massachusetts; J. C. Georg Construction Equipment, Inc., 805 E. Genesee St., Syracuse, N.Y., for central New York; Star Machinery Co., 241 Lander St., Seattle, Wash., for state of Washington and parts of Idaho.

FELDERMAN APPOINTED SALES MANAGER. Joy Manufacturing Co., Pittsburgh, Pa., has appointed L. G. Felderman as sales manager, rock mechanization with headquarters at the company's Franklin, Pa., plant. He formerly was manager, sales engineering for all Franklin products. In his new position, Mr. Felderman will specialize on trackless mining products for hard rock and tunnel applications.

NEW FACTORY REPRESENTATIVE FOR UNIVERSAL. Universal Motor Co., Oshkosh, Wis., has appointed George D. Heath Co., 518 East 16th St., Kansas City, Mo., as direct factory representative for Universal light and power plants in Iowa, Kansas, Missouri and Nebraska.

NEW NAME FOR LIGHT PRODUCTS. Neo-Flasher Manufacturing Co., Inc., formerly Light Products, Inc., has opened a new plant at 3210 Valhalla Drive, Burbank, Calif.

MOONEY APPOINTED PRESIDENT. Glen Mooney has been appointed president of Bosworth Manufacturing Co., Nills Road, Avon, O. He comes to the company directly from Truscon Laboratories, Detroit, Mich., where he was general sales manager.

KNUDTEN NEW VP PETTIBONE MULLIKEN. Herbert J. Knudten, president Universal Engineering Co., Cedar Rapids, Ia., has been elected vice president of the concern's parent company, Pettibone Mulliken Corp., Chicago, Ill. He will continue in his present capacity at Universal and maintain residence at Cedar Rapids.



BUILDING PAPERS



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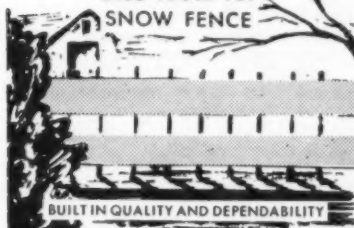
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MANUFACTURING COMPANY

Main Office: Netcong, New Jersey
Plants: Netcong and Stanhope, New Jersey

... for more details circle 228, page 16

ROADS AND STREETS, August, 1955

PIERSON HEADS NEW MARION OFFICE. Marion Power Shovel Co., Marion, O., has appointed Walter Pierson southeastern sales manager with headquarters at the company's new district office and warehouse at Unit 19, Building E, 650 Murphy Ave., S. W., Atlanta, Ga. The MPS district office was formerly located in Birmingham, Alabama.

FENWICK APPOINTED NORTHEASTERN SALES MANAGER. Marion Power Shovel Co., Marion, O. has appointed Paul Fenwick Northeastern sales manager. He will continue to make his headquarters at the company's district office, 787 First Ave., at Forty-Fourth St., in New York, N. Y.

NEW WORTHINGTON DISTRIBUTOR. Brinker Supply Co., Dover, O., has been appointed distributor for the complete line of construction equipment of Worthington Corporation, Harrison, N. J. The territory includes the entire Cleveland area.

HIGHWAY EQUIPMENT & SUPPLY CO., 1016 W. Church St., Orlando, Fla., has been appointed distributor for central Florida for Marion Power Shovel Co., Marion, O.

O'LEARY MOVES. O'Leary's Contractors and Equipment and Supply, Inc., has moved into new enlarged quarters at 4554 West North Avenue, Chicago, Ill. For the past five years they had been located at 4550 West Washington Blvd.

HIPPLER APPOINTED GENERAL SALES MANAGER. Harold H. Hippler, associated with Gar Wood Industries since 1924, has been appointed general sales manager.

NEW HEIL DISTRIBUTOR IN MEXICO. Boyer Motor Co., Inc., Stone and Mabel Sts., Tucson, Arizona, has been appointed distributor for truck body and hoist equipment of The Heil Co., Milwaukee, Wis., in the states of Sonora, Sinaloa, and Baja, Mexico.

T. M. GARRETT RETIRES. T. M. Garrett has retired voluntarily on pension after 35½ years service with E. I. DuPont Co., fifteen years of which he has served as manager of the Contractors Section, Explosives Department. Homes H. McGrath succeeds him as manager.

NEW HEIL DISTRIBUTOR. Teco, Inc., Fannin Road, Jackson, Miss., has been appointed a distributor in southeastern Mississippi for the truck equipment of The Heil Co., Milwaukee, Wis.

NEW JOY DISTRIBUTOR. Joy Manufacturing Co., Pittsburgh, Pa., has appointed Equipment & Supplies, Inc., 540 Delaware Road, Pittsburgh, Pa., as distributor of Joy construction equipment for southwestern Pennsylvania, and parts of New York, Ohio, West Virginia, and Maryland.

**Precision-built for
the man behind the gun...**



Model 3000 \$195.00* complete with tripod.

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the most practical
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HERE'S a Universal Level-Transit specially developed to handle all survey and checking operations. It's sturdy, accurate and exceptionally easy to use. And — a new single truss standard frame design replaces old-style cross bars and wyces. What's more, it has a silvered 4¼" horizontal circle and an easy to read 5 minute vernier.

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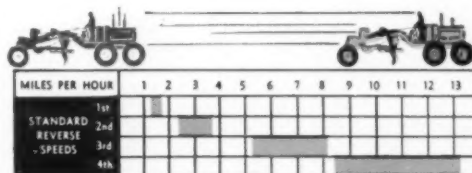
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